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THE

MEDICAL REPOSITORY,

AND

REVIEW OF AMERICAN PUBLICATIONS

ON

MEDICINE, SURGERY,

AND THE

AUXILIARY BRANCHES OF SCIENCE.

CONDUCTED BY

SAMUEL LATHAM MITCHILL, M.D.

AND

EDWARD MILLER, M.D.

Indefinitè aliorum commoda promotum it, qui animam ac corpus suum probe excolit, ut utiles abs se actiones in alios proficisci queant; aut si ingenii per solertiam talia inveniat, quibus vita humana reddatur instructior. Unde contra hoc officium peccare sunt censendi, qui nullam honestam artem addiscunt vitâque per silentium transitâ animam pro sale habent, ne putiscant; *numerus* tantum, et *fruges consumere nati.*

Puffendorff. De Off. Hom. & Civ.

VOL. VI.

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NEW-YORK:

Printed and sold by *T. & J. SWORDS*, Printers to the Faculty of Physic of Columbia College, No. 160 Pearl-street.

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PREFACE.

HAVING now completed the sixth volume of the *Medical Repository*, we think it expedient to incorporate this and the preceding five into a distinct whole, and here to close the present course of the work; in order afterwards to proceed with a new series of volumes of the same number, and conducted on a similar plan.

This set of six volumes, which is intended to form an entire work, independent of what is to follow, is denominated the first *Hexade;* a term which the classical reader will instantly perceive is designed to express a series of *six*, as the analogous and more familiar term *Decade* is used to signify a series of *ten*. The unwieldiness of a larger set of volumes, and the desire of accommodating new subscribers, have chiefly induced us to adopt this plan, which we hope will prove acceptable to our readers. By thus reverting to the point of beginning, we wish likewise periodically to renew the spirit and alacrity of those exertions which instituted the work, as well as to afford an opportunity for such as did not originally assist us by their communications, now to contribute their share of correspondence and patronage.

It will be unnecessary to direct the reader's attention to the benefits which have resulted to Medicine, as well as to all other sciences, from the adoption of periodical publications. They are now so far multiplied, in every part of the learned world, as to form a considerable portion of the means by which knowledge is diffused through all grades of society, and brought within the reach of every inquirer. They present the best means of concentrating into a focus the labours and observations of all who devote themselves to science. They conduce not only to extend the circulation, but also to augment the

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number and excellence of medical communications. Substantial discoveries and improvements may generally be exhibited in a few words, and ought always to be made known in that simple, cheap and expeditious manner which belongs alone to periodical publications. Voluminous and systematic works, the benefits of oral instruction and individual correspondence, are often inaccessible to persons who are ardent in the pursuit of knowledge; but of the source we here recommend all may participate who feel a disposition to inquire. The prevalence of this kind of publications marks an era in the history of the human mind. To cultivate or neglect them may well be considered, at present, as a test of the progress or torpor of society. Their influence on the scientific body may be compared to that of the arteries in the animal body, which carry nourishment, warmth and life to the most distant parts. Or, rather, they may be described, perhaps with more propriety, as the great conductors by which knowledge is transmitted, with electric velocity, through the civilized world.

The advantages of periodical publications on Medicine and Surgery, and all the auxiliary branches of Science, were never so conspicuous and universally acknowledged as at the present moment. Since the commencement of this work, a revolution in the mode of conveying medical instruction to the public has taken place in most parts of Europe, and more especially in Great-Britain. Monthly journals, instituted on liberal principles, and possessing a circulation of unprecedented extent, collect with avidity whatever can promote the progress of Medicine, and then diffuse it, at every succeeding period, to the most distant regions of the earth. The number and reputation of such publications on this subject, in Europe, now surpass all former example, and are incessantly pouring forth a stream of active practical information, which, in value and copiousness, has been hitherto unknown in the annals of science.

The institution of this work was originally undertaken as an experiment on the condition of society and the progress of science in the United States. We were fully aware of the labour, difficulty and discouragement which await such attempts, of the fate of former periodical publications in this

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country, and of the uncertainty of success in this untried field of enterprise. For that public spirit which has constantly assisted our exertions we then could only form our wishes; of the reality of its existence we entertained the utmost doubt.

On a retrospect of the six years employed in completing this first Hexade of our work, it is with equal pride and pleasure that we survey the mass of communications which has enabled us to render the publication acceptable to our readers, and, we trust, reputable to our country. Such a number of contributions to medical and physical science as our correspondents have enabled us to exhibit on the pages of the Repository, is without parallel in American literature. They have been presented by persons in the United States who are among the most distinguished for science, liberality and public spirit. We shall hazard no rashness of assertion by declaring, that a large proportion of them would do honour to the oldest countries, and are alone sufficient to demonstrate the futility of many of the reproaches which are still so frequently thrown on the American character. For this amount of communications, equally unexpected and flattering, we beg leave, in this public manner, to return our thanks. Let the physicians of the United States behold what may and has been done by the aid of their liberal encouragement and co-operation. Let them learn that every country abundantly possesses the materials of similar undertakings, which only require collection and arrangement. And let them likewise learn, that a great many of their communications to the Medical Repository, which, perhaps, were written chiefly as the amusement of an hour of leisure, after traversing in that vehicle the ample territory of the United States, have been re-published in European journals, and, through the medium of various languages, have been circulated throughout the learned world.

In the choice of such papers as correspondents submit to our disposal, we are uniformly inclined to prefer those which are founded on facts and experience, and are practical and useful rather than speculative. We wish always to bear in mind the fallacy of hypothesis, and the durableness of observations founded on truth and nature. Conformably to this, it appears, on a retrospect of the six volumes, that the practical papers

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bear a large proportion to the rest of the work. The period at which our editorial labours began, and during which they have been continued, must be confessed to be singularly interesting in the history of American epidemics. *Pestilential Diseases*, formerly so rare in this country as to have been almost forgotten, have become lately so frequent and fatal as to spread universal alarm. Our correspondents, justly considering this as the most prominent object, have bestowed upon it a principal part of their attention. More than ninety essays or papers concerning the history and phenomena of pestilential epidemics, or collaterally relating to that subject, are found on our pages. Besides these, a variety of other diseases are particularly treated of, in a manner which reflects credit on the learning and talents of the respective authors.

Natural History, which in this young country presents so many aspects of novelty and interest, has not escaped the attention of the contributors to this work. The naturalist will not, indeed, find so great a number of communications on this subject as might be wished, or as the state of our country might readily supply. When it is recollected that an immense proportion of our territory has never yet been explored by a zoologist, botanist, or mineralogist, there will appear every inducement duly to appreciate the few observations we have received, and, as far as possible, hereafter to add to their number.

Nor have our correspondents been inattentive to the interesting province of *Chemistry*, which is allied to so many other sciences, the parent of a multitude of the arts, is incessantly extending its dominion, and may be asserted to comprehend among its objects every substance on the globe. Many of the communications we have received on this subject are read with avidity in every part of the world where letters are cultivated.

Our *miscellaneous* communications, dispersed through the six volumes, and which cannot distinctly be referred to any one head, are numerous and respectable. Many of these enter deeply into the science of the human frame, and, generally, of the animal economy; an inquiry which is rapidly rising to the distinction it deserves, and must soon be considered as one of the most interesting pursuits of the human mind.

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As to those parts of the work, for which the Editors themselves are more immediately responsible, we shall take the liberty to detain the reader only with a few remarks.

In the department of *Review* we have undertaken an arduous task, which nothing but the importance of its relations and consequences could have induced us to hazard. An account of upwards of one hundred and thirty publications, in the course of the work, has been laid before the public. Among many other advantages of the Review, we hope it will be found to preserve the remembrance of some small and fugitive performances of merit, which hereafter may interest curiosity, and which otherwise, in the lapse of time, might be liable to be lost and forgotten. It has been our practice, in general, to offer an analysis of the work under examination, and more particularly to exhibit such parts as include any discovery, improvement, or other substantial merits which are thought worthy of especial attention. Nor have we forborne, generally, to submit our judgment of the character, tendency and utility of these performances; being persuaded that a review, unaccompanied by such declaration, is little entitled to the respect of the public. We are aware that this part of our duty is full of difficulties, and that, after our best exertions, we are often exposed to the charge of partiality and moroseness. It is not easy always to conciliate the minds of author and reader, as each may have a separate interest, and either may be unreasonable or unjust. But the opinions of a reviewer are merely the opinions of an individual; and the author who finds himself aggrieved, may make his defence before the same tribunal of public justice at which he was arraigned. On the points of controversy, which agitate the physicians of this and of other countries, we have not hesitated explicitly to deliver our opinions. And our opponents on these questions, whatever may be their other objections, will not accuse us of versatility or indecision.

Our department of *Medical and Scientific Intelligence* is subdivided into a *domestic* and *foreign* head. Under the former, it has been our aim to collect and arrange whatever of useful, instructive, or interesting matter our country presents to view; to state facts which appear to bear any important relations, and to place on record many things worthy of preservation, which,

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though generally well known at present, are liable soon to be forgotten or indistinctly recollected, Under the *foreign* head, we have endeavoured to exhibit, in a condensed point of view, the substance of all that vast mass of matter which is incessantly issuing from European presses; carefully selecting what is new, important, and applicable to the use of our country, from whatever is of an inferior character. In doing this, we are aided not only by an extensive correspondence with men of science in different parts of Europe, but also by a multitude of the periodical publications in that quarter of the world which we regularly receive, and from which our readers observe copious extracts are frequently taken. On a review of the volumes which now complete our first Hexade, notices will constantly be found, more or less minute in proportion to their importance, of all the leading discoveries and improvements in Medicine and the auxiliary Sciences, which have occurred within the period in question. On this point alone, we might be contented to rest a great portion of the value of the work. Many physicians are remote from libraries, and even if access to them were easy, have no leisure for extensive reading. To such, the Medical Repository will faithfully announce every article of medical intelligence which deserves attention, and, at the same time, give an abstract of much of that new and interesting matter, which the modern traffic of book-making is too apt to scatter through a multitude of volumes. But it ought likewise to be duly impressed on our readers, that, while we consider a selection of the more important foreign intelligence, and other new matter, as constituting a very valuable part of our work, the number of original communications from correspondents in this country, and the quantity of American intelligence, not to be found in foreign journals, are, in our judgment, sufficient to stamp a solid and independent interest on the Medical Repository.

To prevent misapprehension, it will not be improper to observe, that we are moved by no lucrative considerations in the conducting of this work. The Editors hitherto have derived no emolument from it; and every prospect of that kind is at present so remote and uncertain, as to offer no encouragement of such expectations.

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Being now about to undertake a second Hexade, we are determined to remit nothing of the diligence and zeal with which we flatter ourselves the first has been conducted. The first volume will be immediately begun, and published as heretofore in quarterly numbers. We trust our correspondents, to whom we are already so greatly indebted, will continue to afford that assistance which has always served to lighten our labour, and to animate our exertions.

The subject of Medical Biography has been too much neglected in the United States. Physicians certainly owe it to one another to commemorate the talents and virtues of all who distinguish themselves in a profession, so closely allied to the progress of general science, and to the best interests of humanity. It will constantly give us pleasure to be instrumental in recording the merits of such of our countrymen as have deserved well of the republic of medicine.

Our leading objects since the first establishment of this work uniformly have been, to form a centre of communication for the contributors to science in all parts of the United States; to rescue from oblivion the fruits of the experience and observation of our medical brethren, scattered over a widely-extended territory; to allure men of talents from the inactivity which diffidence and retirement are too apt to impose, by soliciting their communications; to give early and authentic information of all such discoveries and improvements in every part of the civilized world as fall within the limits assigned to our publication; to offer some small return to the learned nations of Europe, for the obligations we owe them as our original instructors and parents in science; and, finally, to institute a national work, which may assist similar designs elsewhere in exciting the energies, developing the productions, and hastening the maturity of a young and rising empire. How far we have succeeded in these endeavours, is willingly submitted to the candour and justice of the public.

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OF THE

ESSAYS AND REVIEWS

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MEDICAL REPOSITORY.

VOL. VI.—NO. I.

ARTICLE I.

An Account of an HEMORRHAGIC DISPOSITION *existing in certain Families. By* JOHN C. OTTO, *M. D. of Philadelphia.*

ABOUT seventy or eighty years ago, a woman by the name of Smith, settled in the vicinity of Plymouth, New-Hampshire, and transmitted the following idiosyncrasy to her descendants. It is one, she observed, to which her family is unfortunately subject, and had been the source not only of great solicitude, but frequently the cause of death. If the least scratch is made on the skin of some of them, as mortal a hemorrhagy will eventually ensue as if the largest wound is inflicted. The divided parts, in some instances, have had the appearance of uniting, and have shown a kind disposition to heal; and, in others, cicatrization has almost been perfect, when, generally about a week from the injury, an hemorrhagy takes place from the whole surface of the wound, and continues several days, and is then succeeded by effusions of serous fluid; the strength and spirits of the person become rapidly prostrate; the countenance assumes a pale and ghastly appearance; the pulse loses its force, and is increased in frequency; and death, from mere debility, then soon closes the scene. Dr. Rogers attended a lad, who had a slight cut on his foot, whose pulse "was full and frequent" in the commencement of the complaint, and whose blood "seemed to be in a high state of efferverscence." So assured are the members of this family of the terrible consequences of the least wound, that they will not suffer themselves to be bled on any consideration, having lost a relation by not being able to stop the discharge occasioned by this operation.

Various remedies have been employed to restrain the hemorrhagies—the bark, astringents used topically and internally,

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strong styptics, opiates, and, in fact, all those means that experience has found serviceable, have been tried in vain. Physicians of acknowledged merit have been consulted, but have not been able to direct any thing of utility. Those families that are subject to certain complaints are occasionally relieved by medicines that are inefficacious when applied to others; and family receipts are often of greater advantage in restoring them, than all the drugs the materia medica offers for that purpose. A few years since the sulphate of soda was accidentally found to be completely curative of the hemorrhages I have described. An ordinary purging dose, administered two or three days in succession, generally stops them; and, by a more frequent repetition, is certain of producing this effect. The cases in which the most powerful, and apparently the most appropriate remedies have been used in vain, and those in which this mode of treatment has been attended with success, are so numerous, that no doubt can exist of the efficacy of this prescription. The persons who are subject to this hemorrhagic idiosyncrasy, speak of it with the greatest confidence. Deceptions may take place from accidental coincidence; but when a complaint has often occurred, and been almost uniformly fatal without the administration of a certain medicine, and has constantly yielded when it has been given, scepticism should be silent with regard to its utility. Nor should our inability to account for the fact, upon the theory and principles we have adopted, be conceived a sufficient reason for disbelieving it. An attempt to explain the mode of operation of this valuable remedy might give birth to much speculation. As the affection has been attended with mortality, and there is generally a disposition to give relief as early as possible, experiments have not been made with the other neutral salts to learn their comparative effect; nor have medicines been tried whose operation might be supposed to be similar. The prescription being known to the whole family, application is rarely made to a physician, and when it is, it is rather with a view of directing him how to proceed, than of permitting him to make a series of trials and observations which might be at the hazard of the life of the patient. The utility of the sulphate of soda cannot arise from its debilitating effects, since it has been found serviceable when the previous depletion has been great, the strength much exhausted, and the system has evidenced symptoms of direct debility. Perhaps time will elucidate its mode of operation, and some general principles may be developed that may be applied to advantage in restraining ordinary hemorrhages; but

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reasoning upon what has been discovered to be useful in idiosyncracies, and applying it to the general constitution of human nature, must necessarily be vague and productive of occasional evil. In every case, however, a doubtful remedy is preferable to leaving the patient to his fate. The sulphate of soda has constantly succeeded when administered; but the prescription being in the possession of the Shepard family, the descendants of Smith, and the cases that have been attended by physicians not being very numerous, it is impossible to ascertain the various states of the system in which it has been given, or to form any correct conclusions respecting its manner of acting. No experiments have been made on the blood to discover if any or what changes take place in it.

It is a surprising circumstance that the males only are subject to this strange affection, and that all of them are not liable to it. Some persons, who are curious, suppose they can distinguish the bleeders (for this is the name given to them) even in infancy; but as yet the characteristic marks are not ascertained sufficiently definite. Although the females are exempt, they are still capable of transmitting it to their male children, as is evidenced by its introduction, and other instances, an account of which I have received from the Hon. Judge Livermore, who was polite enough to communicate to me many particulars upon this subject. This fact is confirmed by Drs. Rogers and Porter, gentlemen of character residing in the neighbourhood, to whom I am indebted for some information upon this curious disposition. When the cases shall become more numerous, it may perhaps be found that the female sex is not entirely exempt, but, as far as my knowledge extends, there has not been an instance of their being attacked.

The persons subject to this hemorrhagic disposition are remarkably healthy, and, when indisposed, they do not differ in their complaints, except in this particular, from their neighbours. No age is exempt, nor does any one appear to be particularly liable to it. The situation of their residence is not favourable to scorbutic affections or disease in general. They live, like the inhabitants of the country, upon solid and nutritious food, and when arrived to manhood, are athletic, of florid complexions, and extremely irascible.

Dr. Rush has informed me, he has been consulted twice in the course of his practice upon this disease. The first time, by a family in York, and the second, by one in Northampton county, in this state. He likewise favoured me with the fol-

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lowing account, which he received some years since from Mr. Boardley, of a family in Maryland, afflicted with this idiosyncrasy.

"A. B. of the State of Maryland, has had six children, four of whom have died of a loss of blood from the most trifling scratches or bruises. A small pebble fell on the nail of a forefinger of the last of them, when at play, being a year or two old: in a short time, the blood issued from the end of that finger, until he bled to death. The physicians could not stop the bleeding. Two of the brothers still living are going in the same way; they bleed greatly upon the slightest scratch, and the father looks every day for an accident that will destroy them. Their surviving sister shows not the least disposition to that threatening disorder, although scratched and wounded. The father gave me this account two days since, but I was not inquisitive enough for particulars."

ARTICLE II.

OBSERVATIONS *on the* NATURAL HISTORY *of the Village of* KINDERHOOK, *and its Vicinity.** *By the Rev.* DAVID WARDEN, *A. M. late of that place, but now of Kingston, in Ulster County, (N. Y.) Communicated by* PETER WILSON, *LL. D. &c.*

THE town of Kinderhook, in Columbia county, State of New-York, is situated on the east side of Hudson River, 42 deg. 36 min. N. lat. It is 13 miles N. from the city of Hudson, 20½ miles S. by E. of Albany, 25 W. by N. of Stockbridge, in Massachusetts, and 140 N. of New-York.

From almost every spot in Kinderhook, the Blue Mountains† may be seen; and every beholder must be delighted with them. Sometimes the whole range appears tinged with the colour of a delightful blue. The appearance is variegated and irregular. In winter the reflection of the sun, reverberating from the snow which covers them, has a grand effect. Sometimes their tops are veiled in a cloud. The people prognosticate a change of weather from the mist or fogs which appear

* These observations apply, with the requisite allowance, to all the interior, and middle parts of the State of New-York, and the corresponding parts of the adjoining States.

† For a description of these mountains, see the report on the mineralogy of New-York, in our vol. i. p. 295.

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on the top and sides of these mountains. In summer, if they are enveloped with fogs or vapours, so that their summits are not visible, it is a sure indication of rain; and in winter, the same appearance indicates snow. If every part of the mountains is seen distinctly a sudden fall of rain or snow never takes place.

Soil.

The soil is exceedingly various. Contiguous to the village it is in general sandy, and extremely dry. In some parts the sand is of a red, in others of a white colour. In some places there is found a black loamy soil; and in spots, lately cultivated, it approaches to clay. These soils are likewise mixed in various proportions.

Strata of Earth.

In digging a well thirty feet in depth, the strata of earth appeared as follows: One foot and an half of sandy vegetable soil, five feet of coarse red sand; under this a layer of whitish clay of four feet, then six feet of whitish sand mixed with small shells, then four and an half feet of red clay with streaks of white, and underneath six and an half feet of clay of a brownish colour mixed with small stones.

When we consider how immense must be the quantity of leaves, which, for ages, have fallen from the trees, and the trees themselves falling and rotting on the surface of the earth, is it not surprising that so little of a blackish earth is seen? One would expect to find, from such leaves and trees, an entire morass every where; instead of this, there are few newly cultivated lands among the thickest woods that have more than half a foot of blackish earth. If this blackish earth is, by some natural process, converted into red virgin earth, we might expect to find this virgin earth many feet deep; it is, however, seldom more than one. How such an immense quantity of wood and leaves vanish without the production of much earth seems unaccountable.

I have been informed that it was a custom with the Indians to set fire to the woods, when they wished to rouse many deer, in order that they might shoot them more conveniently. If this was the case, the leaves and decayed trees would of consequence be consumed, as far as the flames reached. But this burning of the woods must have been confined to particular spots, and it is hardly probable that it ever extended over the whole surface of the country.

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Bog.

On the left side of the road leading to Kinderhook Landing, there is an extent of bog of about 150 acres, which, if prepared and made dry, would be excellent fuel. It is covered with coarse grass and small shrubs; but not a vestige is seen of the muscous plant, or *sphagnum palustre*, which overspreads the bogs of Ireland. The bog has been much assisted in its growth by several springs of water, which issue from the foot of an eminence adjoining the road. The water finding no vent, and covering the trees, shrubs, and an immense quantity of withered leaves, blown into it by the wind, from the surrounding height of woods, increased the depth of the bog, and has rendered its growth very rapid. The water has now found vent, which may be the means of retarding its growth, as peat or turf requires much moisture. At present it is nearly four feet above its original surface. It is of a black colour, and very much resembles the *peat* of Ireland. It is the property of Peter Van Schaack, Esq. and will, no doubt, prove a valuable acquisition, when the lands are cleared, and wood for fuel becomes scarce. The bog could be drained at little expense, and if drained, would produce excellent crops. But the most useful plan will be to save it for fuel.

About half a mile N. W. from town there is another piece of bog one mile and a half in length, and one quarter of a mile in breadth. It is three feet in depth, of a dark brown colour. A few years ago it caught fire and burned for a month, in spite of much labour used to extinguish it.

About two miles S. E. from town there is another considerable extent of bog, called the *Long-Vlie*. It is about a mile in length and one quarter of a mile in breadth. In some places it is seven feet deep. It is surrounded by hills, except a small opening to the north. A part of it has lately been drained, and has produced hay of a good quality. The surface of the bog in general is overspread with coarse grass.

About a mile farther S. is another, called the *Lake-Vlie*, about half a mile broad and three quarters of a mile in length.

The peat of these bogs is close in its texture, and in many parts it is very black. Like that of Ireland, it, no doubt, contains fossil oil, calcareous and argillaceous earth, and volatile and fixed alkali. Along its borders the vegetable roots are not decomposed, owing to their not having been long enough exposed to the air.

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As pine trees are often swept into this bog, and soon buried in it, by its growth, it is probable, that, at some distant day, it will be sought for, with an iron spit, as the Irish do, in searching for like trees in the bogs of Ireland, to serve them for firing, and to afford light to those who cannot purchase candles. The great quantity of turpentine which this wood contains, would cause the American pine, when dry, to burn like a torch.

Creek.

What contributes much to the beauty of Kinderhook is the creek, which runs along the east side of the town. It originates from a spring of water, which issues from the bottom of a hill, about 15 miles N. of the celebrated medicinal waters of Lebanon, and flows past them at the distance of 200 yards, describing a N. E. by E. course, but in many parts very irregular. In proportion to the distance from its source, it increases in size, by the conflux of Claverack creek, and several considerable streams, till it mingles its waters with those of the Hudson river, about four miles below Kinderhook Landing.

Four miles from town, and four from the Hudson river, there are three falls of water in the creek, all of which are truly magnificent. Each of them is nearly 200 feet in breadth; two of them are 30, and the third, which is nearest to the Hudson river, is 40 feet in perpendicular height. When there is much water in the creek, it rages over the rocks, presenting a grand appearance. The ear is struck with the rude majestic noise, while the trees shooting forth from the clifts of the impending rocks, and spreading their branches over the rapid stream, make the scene truly picturesque, so that it delights the imagination of every spectator.

At the close of winter, when the ice begins to dissolve, the scene cannot be surpassed; when large masses of ice are hurled over the rocks by the waters of the melted snow, and are dashed to pieces with a noise which strikes the hearer with awe and horror.

These falls, although little known, are thought by some not to be inferior to the *Cahoos*, either in variety, in grandeur, or in beauty. A person of improved taste, viewing one of the falls from a romantic precipice, exclaimed, "that the scene appeared to have a much better effect than that of the *Cahoos* of the Mohawk; and that the roar of the waters over the broken rocks was more enchanting."

There are few houses on the banks of the creek, and its

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beauties can only be seen by those who are willing to endure the fatigue of scrambling through thick woods. The land is yet uncleared, and there are but a few corn or grass enclosures, although the soil is more fruitful, and the situation more inviting than that of any place yet cultivated. In many places, in spring, the water overflows the banks, and leaves behind it a prolific slime, which increases the fertility.

From the quantity of decayed leaves, rotten wood, and plants, in a state of putrefaction, which cover the borders of the creek, and mix with it, we might be led naturally to suppose that its waters are very impure, which is not so; the water being pleasant, and possessing no unhealthful quality.

The creek is often diverted from its channel by large trees, driven into it by the wind, which fasten to some bank, and intercept the earth, stone, &c. carried along by the current. Owing to this, some beautiful islands have gradually increased in size, and some of them are now covered with trees as tall as any of those of the adjoining wood.

Some of the oldest people of the place say that the creek has suffered a considerable diminution. The cause of this appears very obvious. From the place where the creek takes its rise to the North river, of late years, the woods have been destroyed, and the lands cultivated.

It is well known, that trees absorb much moisture, and lessen the quantity of spontaneous evaporation; consequently, when destroyed, the creek will be deprived of one of its constant supplies. In proportion as the land is cleared, the water will diminish. When the population increases, when land is more equally divided, more valuable and more cultivated, some of the most beautiful streams will dry up. To this cause it is owing, that mill-races lose their former quantity of water, and lessen by degrees, till at last they cease to flow.

Lakes or Ponds.

About two miles N. E. of Kinderhook, bordering on Chatham, are three beautiful little lakes, or ponds. The largest is, by the people, called *Fish Lake*; the next in size has got the name of *Round Lake*, and the third, that of *Little Lake*. The first mentioned is about a mile and a quarter in length, from N. to S. and above a quarter of a mile in breadth, from E. to W.

The *Round Lake* is about half a mile in circumference; and the *Little Lake* not so large. They form a communication with each other, and with Kinderhook creek. The bed

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of the lakes, in some places, is gravel, in others mud. In many parts of each pond, the waters are 30 feet in depth, and abound with fish, viz. yellow perch, eel, and other fresh water fish.

A considerable extent of the surface of the lakes is covered with the pond weed. It floats on the surface, the under part of the leaf being in contact with the water. It puts forth yellowish blossoms in the beginning of August. The fish are fond of its shade, especially the pickerel.

The lakes are almost encompassed on every side with rising hills, whose woody tops rise one above another. Their banks are covered with trees and shrubs. In the midst of the largest is a small island, which, viewed from the hill, appears beautiful and picturesque. All the objects of the scene are naturally romantic, and well deserve a visit from those whose taste has been formed for such enjoyment.

A person of taste, with whom I first visited it, after viewing the whole, observed, "that no pencil could paint, nor words describe the delightful variety of objects." We rode on horseback round the borders of the lakes, and crossed over the stream which unites two of them; though we had much difficulty in ascending and descending some eminences, where the only passage is between huge trunks of pine and oak, whose branches form a solemn shade.

In 1786, an iron forge was erected on the stream which runs from these lakes. A mound of earth was raised, and a sluice to confine the water, or suffer it to flow at pleasure. It was allowed occasionally to rise six feet above its natural level, overflowing the meadows, swamps, and borders of the lakes, which were covered with wood.

The banks being overrun with noxious weeds and corrupted vegetables, and laid under water, by the influence of the intense heat of the sun, emitted pestiferous vapours, and impregnated the air with unwholesome exhalations, which, as far as they spread, created an obstinate malignant fever, that proved fatal to many. The people imprudently remained on the spot, and sought no medical aid. The baneful effects of it extended two miles in circumference, and swept about 40 or 50 persons from the stage of life. It was complained of to the Grand Jury as a public nuisance.

Air and Weather.

The air and weather experienced in Kinderhook, is much the same as that of other places in the Northern States of Ame-

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rica, which are at the same distance from the sea, having a similar quantity of cleared lands, &c. The winters are uncommonly cold, and the heat of the summer is almost insupportable. In winter, when the wind blows from the N. W. the cold is very intense, and has a more piercing keenness than when it blows from any other quarter, on account of the extensive surface of snow-capped mountains and other land which it passes over. The air, when inhaled, excites violent coughing; and if the hand, during a keen frost, is applied to iron, or other metallic substances, they will blister it, as if red hot. The moisture of air arising from respiration is immediately converted into snow. A degree of cold is experienced which one scarcely expects in such a latitude. The good state of health which the people of Kinderhook enjoy, with the many instances of individuals arriving to a great age, evinces that the air is very pure and salubrious. It has never been subject to any general fatal sickness; and, compared to the population of other towns, there are fewer deaths than in any other settlement in the state. Many die from mere old age, free from the oppressions of disease*.

Frost, Snow, &c.

The snow, in general, begins to fall about the last of October, and remains on the earth until the middle, and oftener to the latter end of March. It sometimes falls very suddenly, even so deep as 18 inches in six hours. It is often driven by the wind into drifts of six or seven feet. In winter the sun is amazingly bright, the sky clear, and the air pure and enlivening. The heat of the sun, joined with the internal heat of the earth, daily diminishes the snow in the severest season, which is supplied by a fall of more. When the cold is great, the snow is uncommonly fine, and dry to the touch. In this place there is not half the snow which was formerly. I have been informed by persons of undoubted veracity, that they remembered the time when, during the greatest part of the winter, the snows were from two to three feet deep, and were more frequent than at present. Formerly it was customary for the people to assemble and cut passages through the snow,

* Isaac Vosburgh, of this place, was 105 years of age when he died. Eliza Vosburgh was 93. Another woman of the same name was 95; and three brothers, each above 90. Mrs. Pryn is 84, and quite healthy. A slave of Mr. Van Alen's, an African called Cato, is an 100; and a black man of Mr. Vosburgh's is of the same age; both active, and performing natural labour.

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which they called *breaking the roads.* An act was passed for the purpose of forcing them to assemble, in case of refusal. This is a convincing proof that the climate of this region has underwent some considerable change.

The ice is formed so rapidly that the North-River, which ebbs and flows with the sea, as well as the running water of the creek, will be so frozen in one night, that people are seen to walk across in the morning.

The nature of the soil of Kinderhook, which is sandy, prevents the frost from penetrating far into the earth. After two months frost, I dug in a garden, and found that, where snow was, the frost was not deeper in the earth than eighteen inches. In general, it thaws two or three times during the winter; but the thaws are of short duration: there is always more or less of thaw in the month of January. The frosts of some winters do material injury, destroying vegetables and trees. In moist springs, when it thaws by day and freezes by night, the vegetation is very much injured, and the flower buds of the fruit-trees destroyed. If there is no snow on the ground during a frost, after the seed is committed to it, the seed is often destroyed, and all the hopes of the farmer are defeated. As a proof that snow protects the seed in the ground, and serves to promote the growth of the plant, what took place last spring, under the inspection of a very intelligent and observing farmer, need only be mentioned. Seed wheat was sown in a field two days before the commencement of a keen frost, which was followed with a considerable fall of snow, that remained on the field during the winter. The frost was so intense as to prevent any immediate vegetation of the wheat. In the latter part of winter, a sudden thaw dissolved the snow, and the shoots of wheat appeared full two inches in length. The covering of snow must have prevented the cold air from having any effect upon the earth, while the internal heat of the earth must have melted the frost and promoted the natural growth of the plant. It has been a matter of surprise that the great moisture from the snow does not altogether drown the plant: it is well known, however, that the moisture occasioned by the perpetual dissolution of the snow is more powerfully attracted by the snow than it is by the earth. This is the case; a cavity is formed between the snow and the earth, which gives room for the plant to shoot forth, and the soil is kept in a fit state for its nourishment. Some idea of the general continuance of the frost is obtained from the ice of the Hudson River. Some years it opens about the first, and

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others about the last of March. On April 8th, 1798, it was so frozen as to bear sleds with heavy loads: it opened the same season on the 15th of the same month, which was the latest ever known. The ice was two and an half feet thick opposite Kinderhook.*

In summer there is often felt an excessive degree of heat. In 1799 it did not rain during eight weeks. The dews in the night served but little to refresh the air. The grass was scorched and withered, and the ground so wonderfully dry, that the village was in danger of being consumed by the woods having caught fire. The people were afraid to smoke a pipe or segar out of the house, as the least spark might set on fire any part of the surface of the ground. The sultry heat was intolerable at this time, even during the night. The flies and insects were more numerous than they generally are. The cows and horses, deprived of pasture (which was burned by the scorching rays of the sun), became miserably lean; while they were almost tortured to death by noxious insects. Notwithstanding the great inclemency of the weather, the climate of this place was not insalubrious; nor was there any violent distemper occasioned in consequence of the intense heat.

The weather is subject to uncommon changes. Sometimes we have an intolerably warm day and cool night. At other times the heat is so great as to prevent natural sleep. Sometimes, in winter, during a thaw, the winds shift to the N. or N. W. and congeal instantly all the waters, so that the roads are covered with one sheet of ice, as was the case two or three times this winter. The most intolerable cold experienced during this winter, though but of a few hours duration, was when the wind was from the south. This cold owes its origin to the vapours which are brought from the sea, and from more moderate regions, into others, where the cold is so great as instantly to congeal them. These icy particles, carried by the wind against the face or hands, penetrate into the skin, which is painful to endure, and is more insupportable than the greatest cold, when the wind is from the north or north-west.

The greatest coldness, in summer, is felt a little before sunrise, and the greatest heat from two to three o'clock in the afternoon. Calm days and nights are by much the warmest,

* This year, 1801, the river opened the 27th of February, which was earlier than it has been for twenty years past.

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from the want of air to increase the evaporation and remove it. The coldest months are December and January; the warmest month is July. April and September approach nearest to the mean annual temperature.

It has been disputed whether the American autumn or spring is more beautiful. It is difficult to know to which we should give the preference. They both are equal to all the ancient fictions of poetic descriptive fancy. For five or six weeks of these seasons the country is a perfect paradise.

"Nunc omnis ager, nunc omnis parturit arbos."

It has been observed by some, that the winter sets in earlier in this part of the country, and continues longer, than it did about twenty years ago; and, notwithstanding this, that the cold is less intense. Formerly the navigation of the North-River was seldom interrupted by the ice before Christmas, or the commencement of the year. Of late years it has been so frozen in the latter part of November, as to prevent sloops from approaching farther than Hudson. This change of temperature is probably owing to the clearing of the woods, and the increasing cultivation of the lands.

A very uncommon state of weather took place during the latter end of December, 1800. After a keen frost and fall of snow, which lasted two weeks, there came a sudden thaw, which dissolved the ice and the snow, and banished every frozen particle from the earth. The season put on the appearance of spring. The trees put forth their buds. Animals and birds, by the influence of the warmth, were roused from their dormant state. Many farmers commenced ploughing. Some rye was sown, and apple-trees planted. The unwholesome vapours steaming up from the earth, by the influence of the unusual heat, in low marshy places, occasioned putrid fevers, which proved fatal to many. In Kinderhook it had no bad effect, except in creating disagreeable sensations and an uncommon lassitude. It was followed by a keen frost, after continuing above two weeks.

Thunder and Lightning.

The thunder is very frequent and terrible. In general there is a thunder-storm after calm hot weather. It is often accompanied with heavy showers, and a violent gust of wind. There is seldom violent and sudden rain without lightning. Immense quantities of electricity must exist in the atmosphere, or the ingredients for producing it, to cause such terrible ex-

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plosions as take place often for several hours together. The rumbling noise often resembles that of a thousand load of stones tumbled from a precipice. Sometimes it begins slow, and increases till the moment it is no longer heard. At other times it commences with claps so terrible as to threaten universal dissolution; while the noise becomes weaker and weaker, till it is heard no more.

On the 20th of July, 1800, after a fine morning, black clouds began to form themselves—the air darkened—the wind shifted, and, at last, blew in a kind of whirlwind: flashes of lightning darted forth from all quarters of the heavens: the thunder roared, and shook the houses to the foundation: the rain fell in torrents: the creek on a sudden overflowed its banks: the roads, which are quite level, were covered with six inches depth of water. For a few minutes the storm was accompanied with hail, which had the appearance of ice. Some of the hail-stones I measured immediately after falling, which proved to be one inch and a half in circumference. The scene presented wonderful grandeur, but terror prevented the enjoyment of it. Sometimes the lightning darted towards the earth in a zig-zag manner. At other times it represented the appearance of streamers sporting in the wind. In one quarter, what is called the forked lightning darted forth of a livid bright colour. The storm lasted above an hour, and did considerable injury. A man was struck dead at Union village, about ten miles from Kinderhook. Several trees were struck, their leaves scorched, and their branches torn asunder. A store in the city of Hudson was much injured, but not burnt. About five miles from Kinderhook it struck a barn full of corn, and consumed the whole to ashes. It rained violently, and much water was instantly thrown upon it, which had no effect in quenching the flame. It killed a horse in an apartment of the same building, and did not injure another standing close to him.

In the summer of 1799, during a storm of thunder and lightning, the store belonging to Mr. Van Vleck, of Kinderhook, was struck on the roof. It stripped the shingles from it ten feet in length, and a foot and a half in breadth. An upright beam conducted it into a lower apartment. A number of pewter tea-pots were placed on a board parallel to the upper floor. About the breadth of a sixpence was melted on each side of eleven of them. The melted parts were black, and resembled the appearance made by exposing the same metal to the flame of a candle. Some of the melted parts

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had the appearance of small concentric circles, as if formed by the nicest art. A division was made in the shelves, in a perpendicular direction, with boards fastened by nails, which attracted the lightning, and tore the boards asunder in the direction of the nails. The tea-pots were wrapped in a double fold of brown paper, which had not the least appearance of being burned, nor even the vestige of smoke appearing on it. It melted the sides of pewter jugs standing on the same board, in the other side of the line formed by its direction into the apartment. A cask of powder was placed on the end of the same board, and was not more than two feet from the outermost jug. After passing along one side of the pewter, it must have returned by the other, else the board would, no doubt, have conducted it to the powder, and blown up the store.

Three men were standing in the store. One of them nearest the door felt the effects of the lightning in its escape out of the house. He was rendered deaf, and continued so for several days. At the same time that the lightning penetrated into the inside of the store, the outside was struck, and an iron staple torn out, with a piece of wood, close to one of the windows in the gable end of the house.

The end of the house, very near the ground, being struck, while, at the same time, the roof was struck several feet from the end, seems to establish the truth of the theory of a double current of electric matter. It is probable that a portion of the earth surrounding the store was electrified with the contrary electricity of that of the cloud above it, and that the store served as a conductor to unite the opposite powers; the one flash descending from the cloud, the other ascending from the earth.

Colonel Vosburgh's store had in it a number of scythes rolled up in straw, which attracted the lightning, and consumed the straw to ashes, without doing any injury except tearing two of the boards from the side of the house.

A man, sitting at the breakfast table, near to the irons in the fire-place on which the wood for fuel is burned, was struck dead, without any appearance of injury done to any part of his body. The upright stalk of iron attracted it very powerfully, and on passing from the iron it took his body in preference to the floor or wall, it being a more powerful conductor. Every part of his body preserved the same appearance as that of a man dying in a natural way.

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There is much lightning seen every week during summer, without thunder. It sometimes continues for whole evenings sporting among the clouds, and affording a grand spectacle. When this is the case, its flashes are of a circular form. Such lightning must arise from large quantities of the electrical fluid, which explodes as soon as produced; the clouds having no communication with the earth. Sometimes, after such lightning, there are violent showers of rain, which are probably owing to the union of the electrical parts of contrary clouds. But it is an observation made by many, that when there is lightning without thunder, during dry, clear weather, it is a sure sign of heat in the atmosphere.

Winds.

It is remarkable that the winds in this place blow, in general, either from the south or north, or from the north-west (which last is called the continent wind), and that they vary but little throughout the year from a northern or southern direction. The cause of this seems to originate from this tract of land, along the North-River, being level for a considerable distance; and having the range of Blue Mountains parallel to it on one side, and a ridge of high hills on the other, running nearly in a direction from north to south, which is the course of the North-River, and which directs the current of the atmosphere, though these ranges are twenty miles asunder. When a wind blows from any point of the N. E. or N. W. quarter, it is reflected by the sides of the hills or mountains, and in the open plain forms a north wind. On the contrary, when it blows from any point between the S. and E. or S. and W. its course is altered by the position of the mountains, and it acquires a more southern direction. If the plain was less broad, it is probable that the wind would be much more violent, on account of being more compressed by the resistance of the mountains.

Here it may be noticed, that, after a sudden melting of the snow; there is almost always a sudden gust of wind.

From an accurate register of the winds which I have kept during twelve months, it appears that they blow more in a southern than in a northern direction. During the summer, and more particularly towards its latter end, the wind is, in general, from the S. During the season of winter, especially in the months of November, December, and January, the wind blows pretty generally from the N. and N. W.

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Stones, Ores, &c.

There are few rocks that appear above the surface of the earth, and loose stones are rarely found, either on the surface, or in any of the varieties of earth, at any depth.

In the creek there is a great deal of hard, brittle slate. The rocks which cause the water-falls are composed of this species. No slate has yet been discovered in the place fit for covering the roofs of houses.

In the crevices of this slate are found great quantities of rock crystal, chiefly of that kind which, by mineralogists, is called *crystallum pellucidum*, and *crystallum flavum*, of the sixth genus of silicious compound earths. The pieces are very irregular in shape, though all of them have one or more sharp corners. I have procured some pieces, nearly a solid inch in bulk, clear as translucid glass, and remarkable for a fine polish. It scratches the surface of highly tempered steel, and cuts glass like a diamond. It consists of a very pure kind of silicious earth.*

About seven miles from Kinderhook, on the left side of the road leading to Chatham, a copper mine has lately been discovered. The mine is on a rising ground. Two veins appear which incline downwards into the earth, at an angle of 45 deg. It is not opened more than twenty feet. The stone which forms the matrix of the ore is the common slate or schistus, of a mixed colour, blue and brown. The ore is of a greenish colour.

Two miles from the town of Kinderhook, a little distance from the road to Claverack, there is a bed of iron ore, which has been wrought. It is situated in the midst of a low marshy piece of soil. The ore forms a considerable part of the substance with which it is combined. It is called by the natives of the place *Bog Ore*. It is of a tolerable good quality, and has been manufactured into the cast iron, forged iron, and steel, which are in common use.

The great quantity of *iron* discovered in so many parts of this country is a proof, that it is formed from vegetable substances by some process of nature. It has been observed by Mr. Smith, on the formation of *iron*, that countries which have large quantities of decayed vegetables are in general furnished with *iron* and chalybeate springs.

The place abounds in argillaceous substances. Clay to the north clay in many places is mixed with about half [illegible]iration. several in- causing a

* Some specimens have been found in the form of a hexahedron terminated by pyramids of an equal number of sides.

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of silicious earth, and when baked, makes excellent bricks and pottery.

In no place in or near Kinderhook, has there been found any instrument, substance, or vestige of antiquity, which might lead us to suppose that this part of the country was ever inhabited by any race of people acquainted with the mechanical arts. Nothing has been discovered except arrow-points, formed out of hard flinty stones, which were used by the Indians, and a round stone or pestle, of three inches in circumference, and sixteen inches in length, with which they bruised their corn or maize, for food, in the cavity of the trunk of a tree formed so by burning it with fuel.

ARTICLE III.

An ACCOUNT *of* FEBRILE DISEASES, *as they appeared in Portland and its Vicinity, in August and September*, 1801. *By* JEREMIAH BARKER, *M. D.*

THE weather during the month of August was, for the most part, cool and rainy. The fruits of the earth were luxuriant, and free from blasts or mildews.

In September the weather was dry and sultry, very little rain falling during the month.

In these months a considerable number of cases of fever, or rather *poisoning*, occurred in Portland and some of its neighbouring towns, though chiefly in the latter.

Almost every case which I attended or was informed of, could be traced either to unclean vessels and cloathing, or to stagnant ponds of water.

The first cases which I attended, wearing any formidable aspect, occurred in the latter part of August.

A merchant in Portland was attacked in the morning of the 24th with a nauseated stomach and chillness, succeeded with a flushed countenance, pain in his head and back, anxiety of the præcordia, and thirst.

He then took an ounce of Ipecac. wine, which operated three times. In the afternoon, however, the pain in his head and eased, with a throbbing of the temporal arteries, and his general as full and quick.

cially in the wind } o'clock I was requested to visit him, when twelve blood were drawn, and his stomach was cleansed kaline emetic, viz. tart. emet. three grains, sal. ab-

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These patients were invariably affected with nausea or vomiting, anxiety of the præcordia and chillness; to which succeeded pains in the head and back, quick and sometimes full pulse, thirst, and a furred tongue. In some few the skin was yellow, in others purple spots appeared.

In every case, however, which came to my knowledge, where alkalines and oils were duly employed, the disease was removed in one week, and no ardent symptoms of putrescency took place, nor any troublesome local affection.

Indeed, when alkaline emetics and oily and alkaline cathartics were employed upon the onset of the disease, the poisonous cause was often completely eradicated; so that no further means were required.

Such speedy and radical cures, I, and several of my brethren, have had frequent opportunities of witnessing; and when we consider the disease as "*the stomach-form of pestilence, produced by a poison primarily acting upon that organ*," according to Dr. Miller's important ideas, we conceive that the happy effects of these remedies may as naturally be expected as in other cases of poisoning.

But when the stomach and intestines were not thus alkalized and cleansed, however liberally calomel was given, for it was used in some cases, the poisonous cause appeared soon to ravage the whole system, producing great disturbance and commotion in the heart and blood-vessels. Besides, in some cases, glandular swellings and painful boils took place upon different parts of the body. In others, the legs swelled, inflamed, and suppurated, producing what are vulgarly called *fever sores*.

Such accidents, in my view, seem to be more satisfactorily accounted for, from the stimulation of poison, accumulated in the particularly affected parts, than from the want of animal irritability or of oxygen, according to some; for it seems very difficult to conceive how a negative power can be productive of such positive effects.

In the three succeeding months the croup prevailed in several towns, and proved mortal in many instances.

Fortunately, in consequence of perusing Dr. Archer's account of the use of seneka in this disease (Med. Repos. vol. ii.), I had procured some of it from Maryland, as it could not be found in this part of the country.

This article I made use of, in the disease, agreeably to the Doctor's mode of exhibition, and it succeeded to admiration.

It actually emancipated the strangling infant in several instances, where the case appeared to be hopeless, by causing a

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viscid and membranous substance to be discharged from the trachea.

The use of seneka, in the croup, has also been attended with equal success in the hands of some others among us.

For a knowledge of this article, as a remedy in this disease, we consider ourselves as indebted to Dr. Archer; and we hope that this discerning and judicious physician will favour us with further investigations relative to formidable diseases.

ARTICLE IV.

REMARKS *on Mr.* CRUIKSHANK'S EXPERIMENTS *upon* FINERY CINDER *and* CHARCOAL. *By Dr.* PRIESTLEY.

To the Editors of the Medical Repository.

GENTLEMEN,

MR. CRUIKSHANK having added a supplement to the account of his experiments on the air from finery cinder and charcoal, in answer to my objections to the new theory from the properties of that kind of air, I have given more particular attention to it, and wish to add the following observations to those which I have already sent to you on the subject.

When I first procured this kind of air I was far from imagining that I had discovered any *new species* of air, essentially different from any other, so as to be entitled to a new appellation, but only another variety in the heavy inflammable air, which is known to be exceedingly various in different processes, and even in the different stages in the same process; all however agreeing in this, that when all fixed air is carefully washed out of them, more is found on the decomposition of them when they are fixed together with dephlogisticated air. And in this essential property the air from finery cinder and charcoal agrees with them all, differing only in the proportion of the fixed air procured in this manner. This, however, I now find must be called *the gaseous oxyd of carbon*, while the others are called *hydrocarbonates;* that being said to consist of two parts of oxygen to one of carbon, and the others to be a solution of carbon in hydrogen or inflammable air.

It cannot, however, be denied, that this gaseous oxyd of carbon is inflammable, as well as the hydrocarbonates, in the composition of which a portion of hydrogen, one of the com-

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ponent parts of water, is a necessary ingredient. This air, therefore, from finery cinder and charcoal, though called an *oxyd*, must be essentially different from all the other oxyds, none of which are combustible, being substances already saturated with oxygen. Thus iron is a combustible substance, ready to unite with oxygen when presented to it in a proper temperature; but when it is saturated with oxygen, and therefore called an *oxyd of iron*, it is no longer combustible. It must, therefore, as it appears to me, be an absolute abandonment of one of the most fundamental principles of the new theory, to call this air, from finery cinder and charcoal, an oxyd. If substances be *combustible* in proportion to their affinity to oxygen, and their consequent readiness to unite with it, this air, which is inflammable, must be of this class, and therefore the very reverse of the oxyds, which are saturated with oxygen, and incapable of receiving more.

If this kind of air was a real oxyd, it would appear to be so in the decomposition of it; when, to make the result unexceptionable, the oxygen it contained would either take the form of dephlogisticated air, or become a component part of some other substance into which oxygen is acknowledged to enter. But this has not been done. When it is decomposed by being fired together with dephlogisticated air, the fixed air that is then formed comes, I have no doubt, from the oxygen in the dephlogisticated air and the phlogiston in this species of inflammable air; the same being the result, though not quite in the same degree, of firing the heavy inflammable air from charcoal and water, the vapour of oil, &c. &c. into which it is not pretended that any oxygen enters.

Mr. Cruikshank's observation of the union of the oxygen in the dephlogisticated marine acid air with inflammable air in common temperature of the atmosphere, is extremely curious; but I do not see that any thing more can be inferred from it, than from the more rapid union of the same principles when inflammable and dephlogisticated air are fired together.

Mr. Cruikshank says, p. 201, that "the oxygen in the "finery cinder uniting with the carbone in the charcoal, forms "fixed air, and that the metal being in the same process revived, "decomposes this fixed air, when it becomes again to a cer-"tain degree oxygenated." But why should not the finery cinder retain a part of its oxygen rather than first part with it, and then take it again? Besides, it is not true that after this process the iron is in any degree oxygenated, for it is completely revived, becoming perfect iron; and that any fixed air is either

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formed or decomposed in this process, is altogether conjectural, and for the reasons that I have given cannot be admitted. For though it might be possible for oxygen in the finery cinder (supposing it to contain that principle) to be extracted from it by its affinity with carbone in the charcoal, and that nothing should enter in its place, the iron thus revived could not decompose the fixed air that would be formed by their union.

I am, Gentlemen,
Yours, &c.
J. PRIESTLEY.

Northumberland, April 12, 1802.

ARTICLE V.

On the MEANS *of lessening the* PAINS *and* DANGER *of* CHILD-BEARING, *and of preventing its consequent Diseases; in a Letter to Dr.* EDWARD MILLER, *by* BENJAMIN RUSH, *M. D. Professor of Medicine in the University of Pennsylvania.*

DEAR SIR,

IT has generally been supposed, that a necessary and unchangeable connection exists between pain and child-bearing. Such a connection, it is true, was established between them, as part of the curse inflicted upon woman after the loss of her primeval innocence. A similar connection was established between labour and the sweat of the brow in man; and yet thousands of our fellow men live without labour, in the enjoyment of all the comforts of life. Even the curse which was inflicted upon the earth has been in part repealed, by the spontaneous or artificial fruitfulness which has succeeded to briars and thorns in many countries. The mitigation of the pains connected with child-bearing has been effected in Turkey, by the use of sweet oil (which acts only as a purge) during the last months of pregnancy. A similar alleviation of those pains has been produced by climate, in a part of Africa, in the Brazils, in Calabria, in Sicily, and in several of the West-India islands. A scanty diet has so far lessened them in the Indian women of our country, that they are able to work a few hours after their delivery, which is sometimes effected without the aid of a human creature. Heaven, in these instances, has kindly intimated to us, that the pains of child-

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bearing are not entailed upon the female sex by an immutable law. In our attempts, therefore, to improve and extend the means of lessening them, we do but develope the kind and benevolent disposition of the Creator of the world to the human race.

To induce a belief in the efficacy of certain remedies which are calculated to lessen, and, perhaps, finally to destroy, the pains of child-bearing at all times, and in all states of society, it will be necessary to premise the following propositions:

1. Previously to child-bearing, the female system is generally plethoric, and unduly excitable, from the ratio between exercise and the appetite being destroyed by an excess of the latter during pregnancy, and from the influence of the distended state of the uterus upon the whole system.

2. Child-bearing is a disease. The form of this disease is a spasm of a clonic nature. It does not militate against the truth of this proposition, that the morbid affection of the womb is not attended with inflammation; for we now know that disease does not consist in inflammation, that it is one of its effects only, and that the highest grade of disease often exists without inflammation. The symptoms of this parturient disease sometimes appear in chills, preternatural heat, thirst, a quick, frequent, full and tense pulse, pains in the head and other parts of the body.

3. The operations of nature in this disease, as in most others, are excessive, deficient, or not properly directed to accomplish her purposes. Their *excess* appears occasionally in great pains in the bowels, in hæmorrhages from the uterus, in convulsions of the whole nervous system, in the total absence of contraction in the uterus from the suffocation of its morbid excitement, in the wrong position of the fœtus in utero, and in the protraction of exquisite and fruitless pains far beyond the time necessary to exclude the fœtus. The operations of nature in child-bearing, I believe, are not often deficient in force. Women who have been debilitated by previous diseases, or by accidental evacuations of any kind, have generally very easy and natural labours.

As a natural inference from the above propositions, I go on to remark, that the remedies for difficult and painful parturition should be the same as for all other convulsive and spasmodic diseases, taking care to vary them according to the force of the disease and the state of the system. As the difficulty and extreme pain of child-bearing arise chiefly from an excess of natural force, or from an improper direction of it,

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I shall first mention the remedies for lessening its pain and shortening its duration.

The first of these remedies is blood-letting. I suggested the use of this remedy, with most of the above reasons in its favour, in my Lectures, in the year 1791. On the 11th of January, 1795, a man came into the Pennsylvania Hospital, whose shoulder-bone had been luxated for two months. All the usual methods of reducing it had been tried to no purpose. Dr. Physick, to whose care he was committed, began his preparations to relieve him, by drawing blood from his arm until he fainted. While he lay in this insensible state, the Doctor reduced the bone with but little force, and nearly in the twinkling of an eye. This easy and happy cure increased my confidence in the lancet in parturition. It was confirmed still more by recollecting its controuling influence over the morbid excitement of the uterus, in preventing abortions in the yellow fever of 1793, and by reflecting on the instant relief which it affords in colics, convulsions, and all other violent diseases, which affect, at the same time, the muscular and arterial systems. But I am happy in being able to add, that my opinion of the efficacy of blood-letting in abating the pains and danger of child-bearing, no longer rests upon reasoning and analogy. Dr. Dewees, of this city, has adopted it with the happiest effects. Dr. Brown, formerly a pupil of Dr. Physick, has lately used it in his practice in Chester county, in our State, to an extent which has added greatly to the benefits derived from it. He seldom draws less than thirty ounces of blood in the beginning of a labour. The consequences of this copious loss of blood, in the diminution of pain, and accelerating the exclusion of the fœtus, have been highly grateful to his patients, and pleasing to their friends. Considering the predisposing causes of plethora and excitability which have been mentioned, I am disposed to believe a much larger quantity of blood than thirty ounces might be drawn in some cases, and at certain times, with advantage. These times are in the winter and spring months, and during the prevalence of inflammatory and malignant epidemics; for, in the latter period, Hippocrates long ago observed labours to be more difficult than at any other time.* It is from the influence of the same state of atmosphere which produces these more difficult labours, that abortions are so common during the prevalence of the plague in all countries.†

* Book i. Const. 3d. † Diemerbroeck de Peste.

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I am aware that this remedy is not a new one to a certain degree; but I believe it has never yet been advised nor used in the copious manner, nor regulated by the morbid phenomena of child-bearing, which have been mentioned.

2. In addition to the loss of blood, suited in quantity to the symptoms of the parturient disease, the bowels should be plentifully opened by means of glysters, and the diet and drinks should contain as little stimulus and nourishment as possible.

3. Perhaps an advantage would arise from advising a low diet to pregnant women for ten days or two weeks before they are confined, also from the use of lenient purges once or twice a week, agreeably to the Turkish practice, during the three last months of their pregnancy. The good effects of this regimen in lessening the violence of the small-pox and yellow fever, encourage us to expect similar benefits from it in the violent disease of parturition.

I have hitherto advised the use of blood-letting, and other depleting remedies, only as the means of lessening the pains and danger of child-bearing; but their advantages would probably extend much further by preventing the after-pains—hæmorrhages—obstructed lochia—retention of the placenta—prolapsus uteri—inflamed breasts—swelled legs—colics—madness and fevers which so often follow delivery. Even the fœtus would probably be benefited by the use of the above remedies, by suffering less from pressure and bruises, in a tedious and painful passage into the world.

You will perceive, from what has been advanced, that the principal design of this communication is to suggest that a morbid action may be converted into a natural one, and thereby placed upon a footing with other actions of the body which are painful or tedious only from disease. The lower limbs and the arms, which suffer exquisitely in a rheumatism, are overstretched, without pain, in running, and lifting heavy weights. The blood-vessels, likewise, when excited into morbid action in a fever, communicate pain to the head and other parts of the body; but the same vessels, when increased in their force and dimensions by the equable and healthy action induced by violent exercise, are never known to produce pain, and subside by rest, without danger, or injury to any part of the system.

The cases of difficult and painful delivery, from a state of the system below that to which depleting remedies are calculated to reduce it, I have hinted, rarely occur. Most of the

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labours I have met with, or heard of, in the last stage of chronic diseases, have been short, and comparatively easy.

Where there is reason to believe the contractions in the uterus will be too weak to expel the fœtus, a cordial diet should be advised previously to the expected time of confinement; and where the absence of throes, and the slow progress of delivery, indicate a deficiency of muscular irritability in the fibres of the uterus, opium should be given in proportion to the exigences of the system. I think I have seen the happiest effects from that excellent medicine, in such cases, in destroying useless pains, and shortening the duration of labour. How far a medicine so powerful (if such can be found) as wholly to suspend the sensibility of the nerves, without impairing their irritability, might succeed in destroying pain altogether, I know not; but the following fact shows that it has been destroyed by a disease which produced that effect upon the nerves. A lady, who had been for several years subject to epilepsy, was delivered of a child in one of her fits. Immediately afterwards she fell asleep. Her child was dressed, and laid by her side. In the morning, as soon as she awoke, she saw this child, and asked with surprise whose it was. Upon being told it was hers, she declared that she had no recollection of having felt the least pain in bringing it into the world. This information was communicated to me by the husband of the lady, a few hours after her delivery, for I was then attending her for another indisposition. In this instance we see what Dr. Darwin calls a sensitive and irritative disease, converted into a disease wholly irritative.

From, dear Sir,

Your sincere friend,

BENJAMIN RUSH.

Philadelphia, May 12, 1802.

P. S. In looking over some old letters upon medical subjects, I met with a communication from one of my former pupils, Dr. Bullus, which forcibly illustrates the principles and practice contained in the foregoing letter upon the parturient disease. In the month of July, 1797, the Doctor was called upon at Reading, in Pennsylvania, to attend a woman, about the last month of her pregnancy, in a malignant fever. By the use of copious bleeding and a salivation she recovered. But her labour soon afterwards came on, "and (says the Doctor), as it continued rather long, I bled her twice. Immediately after binding up her arm, I delivered her of two

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fine boys, without any difficulty to myself and with scarcely any pain to my poor patient. She has since told me that she had never experienced so little pain in any of her former labours, which have been fourteen in number, and that if she were to undergo twenty more she would always be bled in them." In a subsequent letter, dated July 30th of the same year, the Doctor says his patient, whose name is Ann Harkner, had consented to the publication of her case, and that, if necessary, she would subscribe it with her name.

ARTICLE VI.

An INQUIRY *into the* UTILITY *of occasional* BLOOD-LETTING *in the* PREGNANT STATE *of* DISEASE: *Communicated in a Letter from Dr.* JOHN VAUGHAN, *of Wilmington (Delaware), to Dr.* MILLER.

THE sexual complaints of females, and especially those incidental to pregnancy, are so distressing and hazardous in their nature, as to demand the special attention of the faculty. It is, therefore, of the utmost importance that a uniformity of practice should be established in the treatment of those affections which harass the feeble females of civilized countries. But as long as preconceived opinions and popular prejudices are suffered to controul our practice, so long we are liable to error. There is, perhaps, no subject on which physicians are more divided in opinion, than on the effects of occasional blood-letting in the pregnant state; and from a desire of contributting to the determination of this controverted question, I shall preface the present inquiry with a consideration of the nature of pregnancy, and prosecute the subject in the belief of its being a diseased state.

Most writers on female complaints guard us against intrusion on the lines of demarkation drawn by nature in the establishment of mankind. They term child-bearing, with all its present incumberances, a mere natural condition, neither requiring nor admitting of the operation of blood-letting, except in extraordinary cases of disease. But we should not confound the simple laws of nature with the indirect consequences of human degeneracy. It is not presumable that the process of procreation was originally burthened with sorrow and pain; but they are contingences to be found in the archives of hu-

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man misery, enrolled in the list of consequences of the transgression of our first parents. In the commonly accepted translation of the Pentateuch, the penalty incurred by the disobedience of the mother of mankind is thus recorded in the personified language of divine justice: "I will greatly multiply thy *sorrow* and thy *conception*; in sorrow thou shalt bring forth children:" and in the Greek version, or Septuagint, the word *sorrow* is rendered λυπας, which signifies *pains* or *sickness*, and the word *conception*, στοναγμὸς, which signifies *groans*. Hence child-bearing is literally and proverbially designated by the common title of *groaning*. But, I presume, we may very safely rest the question of pregnancy being a diseased state, on what may be termed natural principles; and we shall pursue the inquiry on the ground of experience and observation, without predilection for, or prejudice against existing authorities. The diversified conditions of women shall be duly considered; and the influence of varied modes of living, in preventing or augmenting the complaints of pregnancy, impartially estimated.

The example of women in a simple state of life, who bring forth children with little comparative suffering, is frequently brought forward in support of the position that child-bearing is a *mere* natural condition. "The Brazilian women are extremely fruitful—have easy labours—retire to the woods, where they bring forth alone, and return after washing themselves and their child; the husbands lying in bed the first twenty-four hours, and being treated as if they had endured the pains."

"The Tapoyer women cut the navel string with a shell, and wash themselves and their children every morning and evening after delivery."

"The Californians had adopted that absurdity which is so much laughed at in the accounts of Brazil—that the women, after delivery, used immediately to go to some water and wash themselves and the child; and, in other particulars, to observe no manner of caution, going to the forest for wood and food, and performing every other service the husband wanted."

"The female negroes, on that part of the African continent called Guinea, or Negro-Land, are delivered with little or no labour: they have, therefore, no more occasion for midwives than the female Ourang-Outang, or any other wild animal."

The Indian women, in the interior parts of our own

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country, are said "to have no midwives among them; their climate, or some peculiar happiness in their constitutions, rendering assistance at that time unnecessary. On these occasions they are confined but a few hours from their usual employments, which are commonly very laborious, as the men, who are remarkably indolent, leave to them every kind of drudgery."

The truth of these several statements is not denied; but it must, at the same time, be admitted, that the numerous forms of disease to which mankind are subject, are, in a great degree, owing to the habits of dissipation and effeminacy, and the complaints of pregnancy much aggravated by refined modes and manners. Would it not be equally just to term a female Hottentot an accomplished lady, as to consider a lady of fashion of the present day a mere child of nature?

The effects of habits of effeminacy and dissipation in multiplying the forms of disease, were long since established, and beautifully described in the following emphatic lines, by the poet DRYDEN:

> "Our ancient fathers hardly earn'd their food;
> "Toil strung their nerves and purify'd their blood;
> "But we their sons, a pamper'd race of men,
> "Are dwindled down to three-score years and ten."

The influence of modern manners is more immediately and specially felt by the female sex. Men, in all countries, and under all circumstances, are more or less prompted to exercise by business or pleasure; but the females of civilized nations are generally confined to domestic affairs, the laborious parts of which are performed by servants. Their amusements or pleasurable employments are generally irregular and excessive, much beyond that degree of exercise which promotes a due performance of the animal functions, and gives permanent vigour to the constitution: and an observance of the immediate and progressive symptoms of impregnation, in my opinion, affords demonstrative evidence of pregnancy being a diseased state. The immediate symptoms are, lassitude, depression of spirits, impaired appetite, and a variety of sensations, so equivocal in their nature, that they frequently embarrass inexperienced women, and are generally so imperfectly described as to perplex the physician to distinguish them from the mere effects of suppressed menstruation. The latter is confessedly a *diseased state*. These preliminary feelings occupy the first ten weeks, which may be termed the *forming stage of pregnancy*.

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These affections are followed by sickness and vomiting, a capricious appetite, distressing sensations of heat in the stomach, frequent eructations, faintings, hysteric fits, fretfulness of disposition, disturbed sleep with unpleasant dreams, an uneasiness of the breasts, and a change of the position of the uterus. From the tenth to the twentieth week the complaints depending on the sympathetic connection of the uterus with the stomach and nervous system are exceedingly distressing to delicate women; but when the uterus rises out of the pelvis, and assumes its proper position in the belly, we may consider the second, or *irritable stage of pregnancy*, concluded.

When the uterus is so far enlarged as to be confined above the pelvis, it increases in a rapid progression, and produces an additional order of complaints. The pressure of the gravid uterus on the urinary organs, intestines, and the whole of the abdominal viscera, occasions difficulty, suppression, or incontinence of urine—costiveness, and colic symptoms—swellings of the thighs and legs—cough, and impeded respiration—flushings of the face, giddiness, head-ache, and frequently apoplectic symptoms—and a sense of general oppression in the abdomen. The capacity of the thorax is lessened by the pressure of the uterus against the diaphragm, giving rise to the pulmonic symptoms already mentioned.

During the latter months the pulse is either labouring and depressed, or full, and more or less tense: I shall, therefore, denominate the last described period the *plethoric stage of pregnancy*.

This division of pregnancy into different morbid stages is predicated on the progressive nature of impregnation, and the successive orders of complaints incident to that state. Instead of enumerating the morbid symptoms of pregnancy under the generic character of "the diseases of pregnancy," I have chosen the present arrangement as being more simple and perspicuous, and, I flatter myself it will be acknowledged, more consistent with reality.

It is, perhaps, difficult to define the morbid nature of pregnancy so as to found our discussion of the utility of blood-letting on given principles, and preclude irrelative argument: I shall, however, consider pregnancy as a diseased state, constituted by increased excitement in the uterus, from an accumulation of animal life, and the mechanical stimulus of the fœtus. That pregnancy is a state of extra-uterine excitement, is self-evident to every mother, and manifested to the physi-

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than by the correspondent affections of those parts connected with the uterus by sympathetic association and situation; and the relief afforded to other organs, previously diseased, evinces a concentration of excitement in the gravid uterus; while the tenacity of pregnant animals for life, and the surviving existence of the fœtus in utero after the death of the mother, conspire to prove the extra-vitality of impregnation; and the mechanical effects of child-bearing are obvious to the senses.

Upon this view of the nature and phenomena of the pregnant state, which, from considerable experience and observation, I believe to be correct, I consider blood-letting useful,

1. In the irritable stage of pregnancy, in lessening the tendency to irregular action, and the morbid association of the stomach, brain, and nervous system, from the accumulated sympathies of the uterus; obviating or relieving sickness and vomiting, faintness, hysteria, and the whole catalogue of distressing sensations usually stiled nervous complaints.

2. In preventing and restraining uterine hæmorrhage and abortion. The frequent occurrence of hæmorrhages, and the other harbingers of miscarriage, at or near the third month of gestation, show the existence of inordinate excitement in the uterine vessels, especially in delicate habits, unable to bear the slightest irregularities. The suppression of the catamenia before the embryon is so far evolved as to require ordinary nutrition, subjects some women to a continuance of this constitutional hæmorrhagy during the first three months; an event of the utmost hazard, and only to be obviated by monthly blood-letting at the arm. In a number of cases of women who suffered abortions from this cause, owing to inattention, or prejudice against blood-letting, I have found the loss of a few ounces of blood from the arm, on the approach of anxiety or lassitude, the usual precursors of the menses, give immediate relief, and arrest the approaching evil. And when hæmorrhagy has actually taken place, a counter-determination by the same mean, together with rest in a horizontal position, are the only effectual preventives of abortion.

3. In moderating the complaints of advanced pregnancy, by lessening the volume of circulating fluids, and counteracting the tendency to congestion of the lungs, brain, &c. and obviating cough and breathlessness, oppression at the præcordia, and convulsions.

4. In facilitating parturition. The effects of blood-letting, a short time previous to labour, in moderating the general oppression occasioned by the mechanical burthen of the fœtus,

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and equilibriating the circulation of the blood, demand the attention of the humane obstetrician. And in tedious and difficult labours, a few ounces of blood taken from the arm will often remove a rigidity of the os uteri—relieve cramps of the lower extremities—and happily abridge the parturient sufferings of weakly women, and especially those married late in life.

5. In preserving the constitution of women from the injuries attendant on abortion, and in moderating habitual complaints. It is not uncommon for the morbid states of childhood and puberty to be reproduced by the stimulus of pregnancy. I have seen recurrent palsy, epilepsy, and hæmorrhoids, banished by repeated blood-letting, and renewed vigour given to the constitution.

6. The puerperal state depends much on the previous state of a woman's system, and the delivery of the placenta; and judicious blood-letting will aid the former and facilitate the latter. In several cases of difficulty in removing the placenta, it appeared, on inquiry, that the woman had been troubled with a continual dull pain and sense of soreness at the place of attachment; and, on examining the secundines with attention, they evinced the existence of chronic inflammation. Careful blood-letting, in succeeding pregnancies of the same persons, have afforded them comparatively easy and speedy labours, without difficulty in removing the placenta.

There is little doubt but a plethoric disposition may change the texture of the decidua reflexa, and render it the medium of morbid adhesion. But, when the inflammation is prevented, and the circulation of the blood between the mother and child is free from interruption and oppression, the placenta discharges itself at the severed funis, collapses and falls off. If, however, the funis suffer material compression in a tedious labour, the placenta becomes engorged, the circulation of the chord destroyed, and some hours elapse before a separation takes place; though the child may not be injured beyond recovery. In such cases, an emollient clyster, rest and patience, will, sooner or later, accomplish the expulsion; care being had that a partial separation has not taken place, and an insidious effusion going on in the uterus.

7. Bleeding, from the considerations briefly taken of the pregnant, parturient, and puerperal states, evidently tends to promote the due nourishment and final welfare of the child.

The general utility of blood-letting in the pregnant state is supported by the relative circumstances—

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1. Of pregnant women bearing the evacuation much better than in ordinary cases, and being less liable to faintness, and consequent direct debility.

2. "The distention induced upon the uterus directly, and indirectly upon the whole system, by the fœtus, renders bleeding, in the inflammatory states of fever, more necessary than at other times."

3. Blood, drawn in the latter months of pregnancy, uniformly indicates oppressed or inordinate action.

4. The pulse, when labouring or depressed, rises upon blood-letting.

5. A suppression of the catamenia predisposes to inflammatory states of fever.

6. Bleeding is the most speedy and effectual remedy in difficult or partial menstruation.

7. The cessation of the menses induces "a morbid fulness and excitement in the blood-vessels."

8. Women are less susceptible of cold during pregnancy than at other times.

(To be continued.)

ARTICLE VII.

HINTS *towards promoting the* HEALTH *and* CLEANLINESS *of the* CITY *of* NEW-YORK, *(applicable to all other Cities in America.) By Mr.* SABATIER.

AS a stranger in the city of New-York, I have been led to inquire into the causes and circumstances of the Yellow Fever, which has now become so frequent in its appearance, as to induce the belief that it is permanently fixed. This, certainly, is a very unhappy opinion, as it tends to prevent those exertions to remedy the evil which, possibly, might prove efficient.

It is also a matter of dispute whether, on the contrary, it is not annually introduced from foreign countries or other parts of the United States. Whatever the cause, the real truth is, that the city is not sufficiently cleansed, and that it therefore is not to be wondered at, *when once introduced*, the fever should, even without an annual importation, continue to make its appearance every year, during the hot months, and rage with

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more or less violence, until again rendered inactive by the cold.

People also differ on the subject of the remedies. Some place most confidence on the rigid execution of quarantine, which, in New-York, in certain months, is enforced on vessels and their crews; but very little regard is paid to the examination of persons coming to the city by land. Others think that cleanliness is of most consequence, and two laws of the Corporation, the one "*for regulating the paving, and preventing obstructions,*" and the other "*for preventing nuisances,*" are generally considered as efficacious in this line as any additional rules can make them.

I beg leave, however, in return for many civilities received in this city and other parts of the State, to point out some further improvements which, if they do not completely eradicate the disorder, as I sincerely believe they will if zealously executed, must, no doubt, greatly alleviate it.

In treating the several subjects necessary to attain either of these objects, I shall seldom have occasion to touch on those regulations which are already pointed out by the laws, many of which are of sufficient importance to merit more attention in practice than they at present meet with; which omission is, I find, occasioned by the idea that, except in the unhealthy season, remissness may be indulged without hazard. But this opinion also is as erroneous as the former. A habit of cleanliness, like every other, is the more to be depended upon the more regularly it is practised; and ill-health, occasioned by uncleanliness at any season, may, and assuredly does, lay a broad foundation for disease, in those months when sickness is most active. May not the time arrive, when, by clearing the lands in the back countries and other unknown causes, the winters may be so far ameliorated, that the cold will no longer produce the effect of impeding the disorder? We know that formerly the Tyber was annually frozen over, and we are certain that it never is the case at present.

In those countries where the plague is most known personal uncleanliness is so excessive that the most fatal disorders arise from that circumstance alone. In some, the natives never change the clothes which they wear next to the skin; but in a great measure trust their health to frequent bathings. In others, though attentive to this particular, the inhabitants are indifferent to that which delicacy has ever considered as the most degrading to our nature. The people of the United States, in general, are not to be reproached with the first of

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these causes, but such undoubtedly is the case among some of the poorer people, especially the emigrants. In the second, they are not, perhaps, so indifferent as they are in some countries which boast of greater refinement; but the heat during the months of July and August render every precaution more necessary in this climate than in those, where, though the cold is less intense in winter, the heat also in summer is less in extremes: such negligence in more moderate climates thereby proves an inferior evil in point of health, though by no means so in point of moral delicacy.

The great means of cleanliness, if properly applied, is WATER; and the most certain means of giving to water its natural effect, is, after the application, to get rid of it as soon as possible; and, through that medium, to convey away also those impurities, which otherwise, by floating in the air, would probably be inhaled by the lungs, and so enter into the system, and appear in a variety of shapes to baffle the skill of the physician. Impurities, no doubt, may be removed or rendered inactive by other methods, which become the more necessary where water cannot conveniently be brought to act alone. To this end, lime has been found the most effective, both used dry and mixed with water. The particles, which otherwise would cause disease, like arsenic when incorporated with lead, are rendered inactive when mixed with lime.

There probably is in no country a city where water can be procured and again conveyed away with more ease than in New-York. The point of land on which it is built, with a rapid river of salt water on each side, is in no instance very wide, and it has a ridge running through the middle, from which the descent is amply sufficient to drain all that is superfluous. Even the remoter parts of the city are so situated, that the one river or the other can be made to receive all the drains. No person will doubt this opinion, when it is understood that engineers have found, from experience, a descent of three inches in one mile sufficient to give activity to pure water; but a drain for foul water should never, if possible, be less than two feet in a mile, which is a trifle compared to what can be obtained from the Broadway.

I have divided the observations, herein submitted, into the following heads:

1. Common sewers.
2. Kennels in the streets.
3. Drains above ground from houses.
4. Drains below ground from houses.

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5. Vaults.
6. Docks.
7. Lodging houses.
8. Burying grounds.
9. Cleansing the streets.
10. Watering the streets.
11. Paving the streets.

1. COMMON SEWERS.

Were it possible instantly to convey the whole filth of a city to a place from whence no danger could arise, there would be no use for sewers; but the various liquids used in houses are so impregnated with offensive substances, that it is proper to remove them from the open air as soon as possible. The practice therefore in well regulated cities is to have a common sewer to run through the middle of every street, and with these the drains from the houses and the kennels are communicated. The Romans are said to have made them so large that a cart and horses could be driven through them. In London the modern sewers are circular, and built of a double row of bricks, set on edge, checking each other. They are of a diameter to admit a person to walk in a stooping position. They are often, on account of the distance from whence they run, and the nature of the ground, sunk at the outlet to the depth of fifteen or twenty feet; but this would seldom be necessary in New-York. The bricks ought to be formed in a mould made for the purpose, that the bevel may suit the circumference. They should be of the most perfect manufacture, and the mortar formed of the best materials. The circular shape of a drain or sewer has two very powerful effects. It is stronger than any other; for, if well supported at the sides, it can never be over-loaded, and it is not liable to choak up, because the channel narrows and extends in proportion to the quantity of water running in it: if there is any sediment in the sewer, be there ever so little current, it must wear a channel in the middle of it, and of course, the sides of the mud will cave in and be carried off: but where it is built flat and broad, that cannot often happen, as nothing but a torrent can keep it free. The distance from the Broadway to either river is so short and steep, that, I will venture to say, a *circular drain* would never choak up. In the city of Philadelphia the streets are very flat, and are four times the length of those at New-York, having at present but one river to empty into; on this account the drains sometimes overflow the streets.

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2. KENNELS IN THE STREETS.

The kennels are those drains on each side the carriage way, next the foot pavement, which are above ground, and ought to serve no other purpose than to carry off the rain-water which falls on the pavement of the streets, and such other water as may be used for washing them. But as the water which runs in them must, of necessity, be often impregnated with offensive substances, there should be gratings at short distances to admit the water into the drains running at right angles into the sewers. The gratings should be neither too large nor too small —if the former, the substances passing through being too gross, will tend to choak the sewers; and if the latter, the water will be prevented in its passage, and thereby overflow the streets, unless removed by the neighbouring inhabitants, which is an attention not generally to be depended on. These kennels should never be made to cross a street; but where many ways meet, there ought to be as many gratings; for they must always be foul, and, besides, cause a disagreeable jolt to carriages.

3. DRAINS ABOVE GROUND FROM HOUSES.

The drains when above ground, ought only to convey the rain-water from the tops of the houses into the kennels; and even when applied to this purpose alone, they would be much better if conducted *under* the foot-pavement; for in this case the spouts would not annoy foot-passengers, by spattering on their feet. A narrow crevice of an inch over, to run the breadth of the pavement, may be left open to clear away any obstructions.

4. DRAINS BELOW GROUND FROM HOUSES.

It is on several accounts necessary that these should be well constructed; but principally because they will generally be sunk so deep that the expense of opening the ground will be considerable, and the inconvenience to the public very great, as they must of necessity be as numerous as the houses. They should communicate with the sink of the house at one end, and with the common sewer at the other. There should be an iron grating in an accessible situation to stop any gross matter from flowing into the body of the drain; and just in front of the grating there ought to be a cess-pool, of about eighteen inches square, and two feet deep, below the upper surface of the drain, to receive into it any heavy substances which may have escaped

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from the sink; to which last there ought also to be a grating. With this drain there may be a communicating branch from the vault, to carry off the water; but it should be fixed three feet from the bottom, and care should be taken to empty the privy before the night soil can arrive at that height. See figure 1.

5. VAULTS.

The vaults of privies ought to be constructed of the best materials; and the bricks, if bricks are made use of, should be sufficiently hard and well made to resist the passage of the soil as well at bottom as the sides; the walls should be covered with the best terras work, and by that means made perfectly tight. But a composition of boiled tar and charcoal, finely pulverized, will be found, for durability, superior to any other covering. The vaults, if there is room to extend them sideways, need not sink more than six feet below the surface of the ground. It is of importance to arch them completely over, except where the seats are placed, in order to confine the effluvia from the building. There should be two air funnels in opposite places to admit and let out the air. When vaults are emptied, the soil should be mixed up, and afterwards covered, with coal-ashes or lime, which will almost entirely prevent the effluvia. This should be done by persons who understand the business, who have covered carts, and other necessary conveniences provided, and are licensed for the purpose. The soil should be conveyed out of the city to a distant and retired spot. The detestable and injurious practice of throwing night-soil into the docks, and the use of tubs, unknown any where except in New-York, should be abolished under much more severe penalties than exist at present. See section 5.

It is a very false prejudice to suppose that the springs will be injured by sinking vaults. Every good bricklayer knows, or ought to know, how to make them secure; and, *if any difficulty should in this respect arise*, the master workmen in this branch of trade should be put under license, and be sworn to execute such works as may be thought worthy of legal regulation. It is not uncommon for the laws to dictate to a man how he shall build his house. Great evils require extraordinary remedies, and it must be recollected that we are devising means to rid the community of a distemper little less infectious than the plague. A vault, well built, will not become peculiarly offensive, even though, as in London, it is not emptied more than once in eight or ten years.

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6. DOCKS.

There is nothing in the city of New-York so offensive as the docks, which emit effluvia sufficient, one would think, to cause sickness in every season of the year. The remedies here recommended, may be expensive at first; but if properly executed, I sincerely believe they will prove not only greatly efficacious but profitable, besides being highly ornamental. It will, at the same time, provide for the conveniency of shipping, and prevent the dangerous consequences of the ice, which, in winter, if the ships lay at the end of the wharves, would injure their bottoms. The docks, as they are at present constructed, impede the current as well as the ice, and all the dirt which is either thrown in, or otherwise lodged, remains in the ship until removed at a great expense by hand, and then occasions an excessive stench.

The docks should be extended to one even front from the Battery up the East and up the North rivers, according to the plan proposed by the corporation, with a face of stone, leaving a quay of sufficient width, in front of the stores, for the passage of carriages. This should be not only sufficient for the present commerce of the city, but provide for a future increase. The wharves, which may be built from the quays, should project into the rivers equally from one end to the other, and should be formed by arches, the piers of which should be on one line, and at the bottom and above the common tides have the form of a lozenge. By this means the tides will not be impeded; as would be the case if they presented a square front, but will have their full power, be it more or less, in carrying off the dirt; at the same time, the cakes of ice which run there will be but small, as they must necessarily, in a great degree, be broken and obstructed by the piers, and be thereby turned off into the stream beyond the wharves. The stones of which the quays and wharves are built should be very heavy, not less than a ton each, wherever the water is liable to reach; and every two adjoining stones should be clamped together, and the irons fixed in the stone with lead. If these piers are continued to be built of logs, the filth will still settle between them.—The next thing is to prevent, as much as possible, the filth from lodging in the slips. In order to this, the common sewers should be carried over the arches to the ends of the wharves, and thereby fall as far in the stream as possible. See figure 2.

Another very essential regulation is to forbid people on board vessels laying at the wharves, to throw any thing whatever,

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except liquids, into the slips, but be obliged to reserve their dirt for the city carts, which should go round and ring a bell as a notice of their coming for the shipping, as they by law are enjoined to do for the houses.

7. LODGING HOUSES.

Here, probably, is deposited the seat of the disorder.

For more than twenty years, the town of Manchester, in England, had been greatly afflicted with a contagious fever, which seemed to baffle the utmost skill of the faculty; at length, a few years ago, an inquiry was set on foot, and a report, made by Dr. Ferriar, on the subject, showed that it existed, almost solely, in those lodging houses where the poorest people resided; that many of the lodgings were in cellars, which had no ventilation, were seldom cleaned, and were very crowded: that it often happened, that people coming fresh out of the country, were at night put into beds from whence others who had died of the fever had been buried the same day. The remedies which were recommended were carried into execution, and proved efficacious. I shall here follow the same, with some additions, and have a sincere belief the like good consequences will ensue in New-York, if rigidly attended to; for I believe no doubt remains in the mind of every unprejudiced person, that the yellow fever is more likely to lie concealed in such places than in others.

The first thing to be done is to oblige every person letting lodgings to take out a license. It will be best to make the rule general, in order to avoid invidious distinctions.

The next is to appoint a visiting committee *for this especial purpose*, who shall report all delinquents of the regulations, and note such occasional observations as may occur. This requires only an extension of the 16th section of the present law.

This committee should see the following rules put in execution:

1. There should be but a certain limited number of beds in any room, and every bed should be allowed such a space as will tend to keep the air from becoming unwholesome by too quick a respiration.

2. The rooms should have their floors well washed and scrubbed with soap or ley once a week; the walls and cielings white-washed twice a year.

3. There should be no lodging rooms in cellars.

4. There should be some efficacious prevention of tubs in privies, by obliging every householder to have such a vault on

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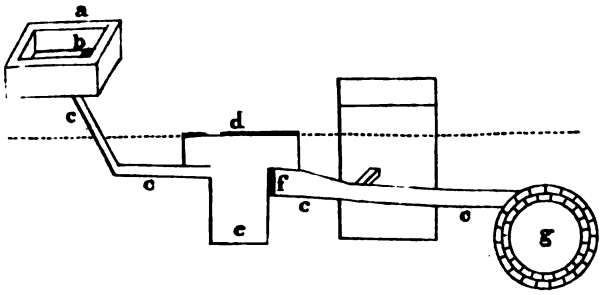
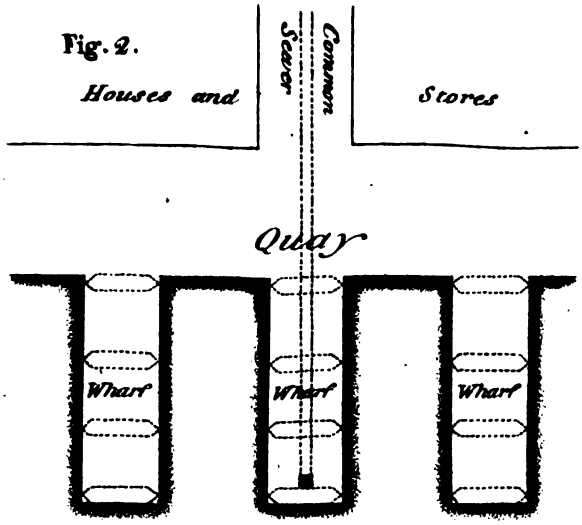
Fig. 1.



a. *The Sink.*
b. *The grating to the Sink.*
cccc. *The House drain.*
d. *A passage from the surface of the yard to the Cess-pool, placed before the grating of the drain; made big enough to admit a person to go down to clear it out and repair the grating. This passage should be built of brick, and covered with a trap-door, laid flush with the pavement of the yard.*
e. *The Cess-pool.*
f. *The grating to the drain.*
g. *The Common sewer.*

Fig. 2.



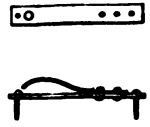


Fig. 3.

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his premises as is deemed to be of the best construction. A matter of such essential consequence ought not to be left to the judgment or caprice of any individual. See section 16th.

5. The floors should be sound and tight, that if liquids are spilled, dirt and wet together may not be collected underneath, and occasion ill smells.

6. Every means of ventilation ought, at least, to be recommended, and, if necessary, should be enforced. When two rooms are contiguous, it is convenient to have a window between them, in order that a thorough draught may be had in hot weather; but it should be an object of police to promote the making of sashes to let down at top, as well as lift up at bottom, for all heated air has a tendency to rise, and is least pure at the top of the room. Ventilated at top, it is sure to be as pure at bottom as circumstances will admit; but although every person is sensible of this property in nature, how very few sashes, except in the dwellings of rich people, are so constructed, and this on account of the expense of the lines, pullies, weights, and carpenter's work; all which are unnecessary, for two springs to each sash (one on each side) if well made, will be found to be simple, cheap, equally useful, and much more neat, as they are placed completely out of sight. The stiffness of the spring should be proportioned to the weight of the sash. See figure 3.

8. BURYING GROUNDS.

If properly attended to, the rules established for the burial of the dead in the 14th section of the law, will probably answer every object required; but should further precautions be at any time necessary, the adoption of the practice of burying in lime, very prevalent in some parts of Europe, will effectually guard against ill consequences from death by means of any disorder whatever. There may be some prejudice against such a practice among a people not accustomed to it; but in case of a very extraordinary mortality, such a measure may become absolutely necessary.

9. CLEANING THE STREETS.

The streets can never be well cleaned if left to be executed by the individuals of the public, as ordered by the sections of the law Nos. 1, 2 & 3.—House-keepers will generally have it done by their servants, who will neglect it from idleness or indifference. All that can be expected from them is to sweep and wash the foot way, and in this even some attention should

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be paid by their employers, or it will be but half performed. I am convinced that in many places near the wharves it is never done. Taken as a general rule, it will be found that the zeal which depends on individual exertion, when unattended by pecuniary advantages, is short-lived and feeble. The surest way is to pay for the doing of it—it will be but a trifle for each inhabitant, and then, instead of being an advocate for neglect, the house-keeper will become an inspector to complain of the omission.

10. WATERING THE STREETS.

Another reason why the streets are not well cleaned, is the dust, which is occasioned by sweeping them in those months when cleaning is most required. In hot weather windows must be opened, and if so the furniture and goods will be injured, and much trouble be given to every inhabitant of the premises, as well as to all the neighbours. Some people go out of town and leave the business entirely to others, without any attention whatever from themselves. A few indeed, more particular than their neighbours, may use the watering pot to lay the dust, but that practice is not universal, or at least sufficiently so to be in any essential degree depended on.

A better method is to have water cocks in every street, and at a certain hour to set them running. The scavengers, with scoops, should sprinkle the carriage way, and the carts take it up immediately. It is important that the number of the watermen, the sweepers, the carts, and their attendants, should be proportioned to each other, which experience only can regulate; otherwise the water will be exhaled before the sweepers come, and the dirt be spread again by the carriages before the carts arrive, or else they will wait for each other. So many water cocks set running at a particular hour, will infallibly keep the sewers clear, and have the further advantage of being always in order in case of fire.

11. PAVING THE STREETS.

The inconveniences and evils attendant on bad pavements are numerous. Wanting frequent repairs, they become more expensive than those which are well executed. The additional wear of carriages can more easily be imagined than calculated. They never can be well swept, for the broom cannot always reach to the dirt, at least it will take longer time, and therefore is an inducement for neglect. The holes are receptacles

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for offensive articles, and even a hard rain, instead of contributing to cleanliness, has a contrary effect, by fermenting those substances, which in a dry state would, in some measure, continue inactive, and in a great degree harmless.

Paving streets should never after the first time be executed by the individual inhabitants of a city, but by persons appointed and paid by the Corporation. This method would not be so expensive as that directed by the 7th clause of the act.

Cobble stones, at best, make but an indifferent pavement. In the city of London they bring squared granite from Scotland, and find it turn out much the cheapest method. This article abounds in the eastern states.

Before I conclude, I beg leave to recommend one general practice, which will save much trouble and produce a greater perfection in all public works undertaken in this city and state. It is to procure every information on the subject from older countries. There is no man or society of men possessing so much intuitive knowledge as to be placed above the necessity of advice. By despising other people's experience we are often led into a situation past remedy; and when we may wish, in future, to render a work complete, we probably shall find that to obtain some radical principle which has formerly been by neglect omitted, we must throw down the whole fabric in order to get at the defect. Many additional lights may be thrown on all the subjects here only touched upon, particularly the articles of common sewers and vaults, the former of which in London is placed under a particular set of commissioners, and is in that great city become a subterraneous topography astonishingly complicated, a complicacy easily avoided in New-York. In London improvements for ages have gradually been making without regard to the direction of the sewers; sometimes they run across the streets, sometimes oblique, and often under the houses; but in New-York the direction of the streets is usually the best course for the sewers.

A work like this must take time, and will require patience and perseverance, but the propriety of it must appear so evident that it ought to be begun as soon as the necessary information can be obtained.

In regard to the rest, that is, the regulation of lodging houses especially, and indeed some of the others, they may be made to take place in the course of the present season, and the remainder within a year or two.

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But every subject contained in these few pages is of such importance in point of *health*, *convenience*, *beauty* and *profit*, that an office, subject to the controul of the Corporation, should be appointed to carry the whole system into effect, and then New-York would, in truth, be the first city on the continent of America, and in time vie with some of the most splendid in Europe.

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REVIEW.

ART. I. *Discurso Apologetico, que convense clarissimamente con obcervaciones, y experiencias, la qualidad contagiosa de la enfermedad mortifera vulgarmente llamada vomito negro, fiebre amarilla, o mal de Siam: manifestativo de las causas comunes, y particulares productivas de la disposicion necessaria en los humores para engendrarse, &c. &c. i. e. An Apologetical Discourse, which most clearly proves, by observation and experiment, the contagious quality of the mortal sickness, vulgarly called black-vomit, yellow fever, or disease of Siam; shewn from a view of the general as well as the particular causes which produce the predisposition in the humours necessary to generate it, &c. &c. By Dr.* D. Roque Josè de Oyarvide, *&c. &c.* 4to. pp. 76. *Havanna.* De Mora. 1801. *With the necessary licenses.*

LITERARY and professional productions from Spanish America do not often come into our hands. But by the polite attention of John Morton, Esq. the consul of the United States at Havanna, this publication has been sent to us. And while we express our respectful acknowledgments to this gentleman for his regard to ourselves, we think much commendation is due to him for his vigilance in transmitting to his own country such intelligence as he can collect concerning the diseases by some deemed contagious in the place of his present residence. It manifests a patriotic spirit to send home the books printed abroad which treat of distempers said to be catching by means of a venom spreading from man to man, and which, according to this opinion, there may be danger of introducing in the ships which trade to such foreign ports.

The piece is divided into three parts. Of these, the first, which occupies forty three pages from the beginning, is the main body of the performance. The second is a supplement which runs to the seventieth page. The rest of the book is filled up by a dissertation on yellow fever, which is here republished from the newspapers, in which it had originally been offered to the inhabitants of Havanna, in November, 1800. This latter composition is addressed to one of the author's correspondents, and his object is to show, that black-vomit, or yellow fever, differs from common malignant and relaxing dis-

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eases, and may emphatically be called, "deadly, putrid, malignant, venomous and atrabiliary" (p. 70). The whole is dedicated to Sig. Del Muro, governor of Cuba, &c.

Dr. Oyarvide professedly and zealously maintains the contagious nature of yellow fever, and, like other persons who advocate the same side of the question, either mistates facts, or reasons badly upon them. We discover nothing that looks like a careful induction from the phenomena; but the essay appears more a display of the writer's opinion on the subject, without troubling himself or his readers with proofs. To such people as know Dr. O. and have firm reliance on his understanding and candour, the pages he has penned may possibly be conclusive evidence; but for indifferent persons, like ourselves, who ask for something more than the *ipse dixit* of a reasoner, a great deal more testimony is required. Indeed, so barren is this "Apologetical Discourse" of new facts, and of new reasonings upon facts already known, that when we consider the incorrect and obscure view which Dr. O. has taken of yellow fever, we are almost inclined to think he is concerned in the partnership existing among the pamphlet-writing contagionists and importers of the United States. He could scarcely have written with less intelligence or edification if he had been aided by the most distinguished of that brotherhood.

But to satisfy our readers we shall give them a specimen of this author's manner of thinking and writing. He affirms (p. 4.) "that contagion is nothing more than an infection, with a resemblance in two or more bodies of the same nature. There are *three* kinds of it; the *first* communicating its mischievous ferment from one body to another by physical contact, as happens to fruits, one of which is rotten, and the contiguous one is sound; the *second* is by a fomes contained in the clothing and attire of persons labouring under leprosy or consumption, and is communicated by that means; the *third* form of it is that which is not only communicable by contact and fomes, like the two former, but to some distance. This latter kind is the more fierce, devouring and active, as it constitutes the contagious medium of volatile pestilential effluvia, connected and combined with a very viscid matter, and manifests itself in the plague, small-pox, measles, and other distempers, whose contagious particles impregnating the air, are elevated and transported by it to a distance. It is to be observed that the contagion which is communicated at a distance, is also communicable by contact and fomes; that which is so by fomes is also by contact; and the third kind alone is transfera-

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ble to a distance; nevertheless, all the three are communicable by physical contact."

Perhaps this extract may not be understood. We shall attempt another from p. 6. where Dr. O. writes of the operation and constituent parts of contagion. "The best practitioners consider that three conditions are simply necessary for the communication of any contagious mischief whatever; the morbid body which emits the contagious miasmata, the sound body of its natural constitution which receives them, and the operative cause between the two, which is the contagious effluvium. That this operative cause may have its effect, three other circumstances are equally requisite. These are a predisposition on the part of the recipient, a due distance, and activity in the contagion or causal means; the failure of either of these deprives the means of its activity and defeats the contagion. This means or contagious miasma is nothing more than fermentible effluvia highly active, changed and corrupted, connected with a living miasma by corrupting and inhering in its natural mixture, and these being intimately mixed and closely combined, produce mischievous contagious effects in proportion to their activity and malignity."

It is probable this paragraph also is unintelligible. We think it savours so much of nonsense, that our chief inducement to translate it was to let our readers know what ideas of contagion were entertained among some of the Spanish physicians in the West-Indies. We hope they will excuse us from making a version of any more of it. They may be curious, however, to know his explanation of black-vomit; here it is. After citing Aristotle's opinion of putrefaction, he affirms that the exciting cause of black-vomit is the poisonous ferment or substance called "Atrabilis;" the nature of which is very acrid, corrosive, dissolving and resembling the tincture of cantharides! and supports it by the authority of Galen. To atrabilis he ascribes a world of destructive action, and among a great number of other sad effects, tells how it corrupts the humours, balsams and spirits, and dissolves the bonds which connect the soul and body, with much more in the same style.

In the course of the work, various cases are related of yellow fever imported in vessels, and catched by one person from another. On examining them they seem to be the same sort of mutilated and half-told narratives that have often been published among ourselves: a ship, for instance, arrives in a most foul and pestilential condition; a number of persons have died on the passage; the survivors are sickly; of the persons who

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go on board, several are taken sick, and die too; and among the passengers and crew who are taken on shore the mortality continues; by their personal nastiness, some nurses, washerwomen, &c. are taken sick, and also lose their lives, &c. &c. from all this it is concluded the distemper is imported from a *foreign place*, and spreads by contagion: now all this requires further examination, and on making such examination it will turn out that the pestilence was *engendered on board the vessel from filth*, is not *catching from man to man* like the small-pox, but ceases as soon as *pure air, clean water and alkaline* salts are applied to the bodies, clothes and bedding of the sick. Neither foreign importation nor specific contagion have any agency in the business; it is a mere case of common nastiness turning to poison, and punishing those who wallow in it or neglect to purge it away—Such of our countrymen and friends as are in want of these sorts of facts to prove importation and contagion, will find a number of stories to their purpose in Dr. O.'s book.

He is very much puzzled to explain how Messrs. Girard and Helm escaped the contagion while attending the sick in the hospital of Bush-Hill, near Philadelphia, and, upon the whole, seems inclined to ascribe their escape not to the lack of contagion, but to the goodness of God.

Dr. O. like a consistent contagionist, contends, that the distemper is imported into Havanna, by the Anglo-Americans,* from their cities on the continent, as they come thither to trade from their desolated and sickly settlements at home, (p. 45.) and, wonderful enough, from Havanna, it has been here pretended it was carried to Cadiz, though the Cadizians know better. See the account of their pamphlet in our present number.

The following is his opinion of the matter of black-vomit. "The productive cause of this is (p. 64.) an humour called atrabilis, of a poisonous nature, engendered in our machine; this is composed of particles or salts of an acrid, corrosive volatile alkaline or arsenical nature, so that they melt, dissolve and destroy excessively the substances contained in the mass of blood," &c. &c. How different such whimsical conjecture as this, from the bold and instructive experiments of CATHRALL, (Med. Repos. vol. iv. p. 163.) and PHYSICK, (ibid. vol. v. p. 129.)

* Y no siendo menos considerable y temible el azote mortal vomito negro que amenaza y estàn muy expuestos à sufrirlo en alto y lastimoso grado los moradores de esta Ciudad è Isla, por el trato y comunicacion con los Ingleses de Norte America que aniversariamente la padecen en sus provincias, con tanto rigor que las tiene desoladas, &c. &c.

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ART. II. *Rules of the Bahama Agricultural Society, established in* 1801. 4to. pp. 8. *Nassau.* Eve & Owen. 1801.

NO more than the title of this is mentioned, as the proceedings of the association may be seen in the succeeding article.

ART. III. *Communications on different subjects, addressed to the Bahama Agricultural Society.* 4to. pp. 63. *Nassau, New-Providence.* Eve. 1802.

SOME time in the year 1801, an agricultural society was formed at Nassau, with the intent of embracing the interests of the planters on Exuma, Long-Island, Caicos, and the other parts of the Bahama government. The public spirit of the founders of the institution concurred with two other causes to carry the project into execution; the one of which was the failure of their crops of cotton for several years past, and the other a diminution of the captures and prizes which had been a source of employment and wealth during the war.

Since the cessation of hostilities by the peace of Amiens, the planters of the Bahama Islands have turned their attention to the improvement of their lands, and already, in about a twelvemonth since their society was embodied, a volume of their communications is laid before the public. Perhaps there are few regions where associations of this kind are likely to do so much good as in the present case, and it is pleasing to observe, that they who are concerned in the undertaking are fully sensible of it.

The pieces in the collection are ten in number, and are directed to various objects of Bahama cultivation and economy. They are on the following subjects: 1. *Colonel Brown's remarks on the management of Bahama plantations, particularly as respects crops of cotton and grass, trees and shrubs for ornament and for food of stock; bees, cement for terraces, tobacco, provisions for negroes, wells of fresh water, manure and indigo.* 2. *Experiments on the productiveness of the sugar-cane in the Bahamas, by James Tait, Esq.* 3. *Directions for the culture of coffee, by Duncan Stewart, Esq. of Jamaica.* 4. *A letter from Dr. Brickell on the advantage of covering up manure to prevent its exhalation and dissipa-*

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tion. 5. *On the preservation of fruit-trees, by the President Nathaniel Hall, Esq.* Mr. H. observing his lemon, orange and lime trees to be covered with a kind of smut, and be overrun and devoured by pismires, ordered their trunks to be white-washed with strong lime as high up as their branches, and lime-water (aq. calcis) to be sprinkled over their leaves. This had the desired effect; the insects were killed or driven away, and the trees, renewing their foliage, became strong and vigorous. 6. *On the virtues of the chiococca, David's root, or snow-berry-tree, by the Rev. John Richards, secretary of the society.* This we insert entire.

"As there are but few papers relative to the natural production of these islands, at this early period of the society's meeting, an account of the virtues of some of our wild plants will not be unacceptable to the society, or uninteresting to the community. I have known the chiococca to have very salutary effects in healing obstinate ulcers. The remedy was applied by a Mr. Patterson towards curing the ulcers on the face of an old woman of the name of Brown, then seventy years of age and upwards; she was a pauper on the parish, and had medical advice, but without effect. The ulcers were very disgusting to the sight, and had eat the flesh, to the cheek bone; the wounds were continually running. I met Patterson one day, who said, Mrs. Brown was in a deplorable case; he could cure her with some roots if he were permitted. I said, I thought he could do no harm, as she was in a very low state, and all former applications had proved useless. In a week afterwards, I went to see Mrs. Brown; I found the ichorous matter had ceased running, and that her face was healing very fast, and at last the ulcers entirely dried up. I was surprised at the sudden and salutary effects of the application. I then entreated Patterson to tell me what he applied, which, after much solicitation, he did—with the proviso of not divulging it then, and said it was the root of a bush called the rat-root, whose virtues he became acquainted with from some Mosquitto Indians. He shewed me the tree, and upon examination, found it to be the chiococca, or snow-berry-tree. The shrub is of the class pentandria, order monogynia: the shrub is not above nine or ten feet high, the highest; its long and slender branches, if so high, are supported by other trees, or trail along the ground; the leaves are eliptical, resembling those of a myrtle, or a jessamine; the bark of the trunk of the tree is whitish, and the bark of the root emits a strong smell, and is of a bitter taste, resembling that of the seneka root. The corol is small and

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white, with the edge divided into five segments, containing five stamina longer than the corol, with a very slender style, of the same length with the stamina. The spike bearing the flowers and berries resembles that of an English white currant. The berries are round, of a snowy colour, and about the size of a small currant. In October and November the tree is covered with berries, as with a covering of snow. It grows in the bottom, south of Fort Charlotte, and on the side of the New Road, before the wood was cut down. There are two kinds of it on these islands: the one at New-Providence is small, and round berried; and there is a larger one on Harbour Island, oblong berried. Dr. Brown thus speaks of the virtues of the plant in his natural history of Jamaica. 'I have known it administered with great success in obstinate rheumatisms, and old venereal taints, in the spina ventosa, commonly called Boneake. I have frequently observed the stubborn complaints eased, and sometimes removed, by the continued use of this, and a few mercurial alterants; but it is best used in decoction, which may be made stronger or weaker, as occasion requires.' The smaller the plant is, the more sharp and biting the root is. Patterson's method was to give a tea cup full of the decoction, and then bathe the ulcers with it.

"From these observations, we may conclude the virtues of this plant, worthy of further trial by medical people."

7. *On the cultivation of the Otaheite or asparagus bean, by the Rev. Mr. Richards.* The writer describes and recommends an excellent variety of the phaseolus, a native of the South Sea Islands, and well adapted to the Bahamas. 8. *On the gum arabic tree, by the same.* One of the mimosas, which afford this valuable gum, is growing thriftily at New-Providence. 9. *A letter from Mr. Alexander Anderson, superintendant of the botanical garden at St. Vincents, to Governor Dowdeswell; with an account of the exotic plants sent from the botanical garden in St. Vincents, to the Bahama Islands.* This we extract entire, as it affords an admirable example of the care taken by the British government to improve their colonies.

"About the end of the last year, I was requested by Sir Joseph Banks, to prepare a collection of the useful plants here, for your government. I have now the honour of sending them. I hope they will arrive safe, and prosper with you. The uncommon dry season in this island has very much retarded the increase of the young plants from the roots of the bread-fruit; consequently, a much smaller supply of them is sent than I intended. With difficulty have these been pre-

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served in the boxes for some months past. But I will always be happy in supplying your government with them, or any other production here, as good opportunities offer.

" All at present sent are valuable in commerce, medicine, food, œconomy, or as fruits. Should gentlemen in your islands wish for ornamental or curious plants, they will be gratified as soon as in my power.

" I think the oriental spices will thrive in your colony. From that idea, I have sent a large supply of cinnamon. The clove is a tender plant here, while young; probably it may be more hardy with you. I am sorry three plants are all at present I have in a state for transportation.

" As the product of the cochineal is a great desideratum in the British colonies, I have sent some plants of the cactus the insects chiefly exist on. In my opinion, the Bahamas are well adapted for that culture, and the best situated of any colony for obtaining the insect from the Spanish Main. That might probably be accomplished by some address and a little money, by the way of La Vera Cruz or the Bay of Honduras; and I think it is an object that merits the attention of the inhabitants of your government. I have the honour to be, &c.

List of 466 *plants, sent for the government of the Bahama Islands, of the following species,* 53 *in all:* to wit,

Artocarpus incisus, *Otaheite Bread Fruit.*
East-India ditto.
Seed bearing ditto, *Malabar Chesnut.*
Artocarpus integrifolius, *Jack.*
Laurus Cinnamomum, *True Cinnamon.*
Laurus Cassia, *Cassia lignea.*
Caryophyllus aromaticus, *Clove.*
Cycas circinalis, *Sago.*
Mangifera Indica, *Mango.*
Eugenia Malaccensis, *Malacca Apple.*
Inocarpus edulis, *Otaheite Chesnut.*
Jambolisera pedunculata, *Otaheite Plum.*
Aleurites triloba, *Otaheite Walnut.*
Spondias dulcis, *Otaheite Apple.*
Terminalia Catapa, *St. Helena Almond.*
Copaifera officinalis, *Balsam Capivi.*
Quassia amara, *True Quassia.*
Mimosa Nilotica, *Gum Arabic.*
Curcuma longa, *Turmerick.*
Tecktona grandis, *Tick Wood.*

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Myristica Americana, *Tobago Nutmeg.*
Thea viridis, *Green Tea.*
Olea Europea, *Olive.*
Carolinea Princeps, *Tobago Bread-Nut.*
Aloe perfoliata, *Succotrine Aloe.*
Cinchona cymosa, *St. Lucia Bark.*
Maranta Arundinacea, *Arrow-Root.*
Cordia dichotoma, *Otaheite Yellow Dye.*
Sapindus edulis, *Leichee, Chinese.*
Acca disticha, *Gooseberry Tree.*
Averrhoa bilimbi, *Cucumber Tree.*
Areca Catechu, *Areca or Beetle-Nut.*
Quassia Simaruba, *Simaruba.*
Epidendrum Vanilla, *Vanilla.*
Convolvulus Batatas, *Six Weeks Potatoe.*
Kæmpferia Galenga, *Galengal.*
Otaheite Plantain, two kinds.
Andropogon Schananthus, *Lemon-Grass.*
Prunus Noyeau, *Noyeau Plant.*
Bourbon Cotton.
Dorstenia Contrayerva.
Bignonia opthalmica, *Eye Vine.*
Ilex vamatoria, *Paraguay Tea.*
Justicia pectoralis, *Garden Balsam.*
Asclepias asthmatica, *East-India Ipecacuanha.*
Piper Nigrum, *Black Pepper,* as yet doubtful.
Piper Betel, *Betel Plant.*
Piper longum, *Long Pepper.*
Cissampelos Pareira, *Pareira brava, of the Brasils.*
Cactus Cochinilifer, *Cochineal Plant.*
Aristolochia odoratissima, *West-India Snake-Root.*
Allamanda cathartica.
Tacca Pinnatifida, *Otaheite Potatoe,* a Root.

"*Description, uses, &c. of the plants.*

"The *Bread Fruit* grows fast to a large tree. In a good situation it will produce fruit in two years. It loves a free circulation of air, and should be planted at no less distance than sixty feet from any other tree, and nearly the same from one another. There are six varieties or kinds of it, differing in the leaves as in the fruit: The fruit also differs in size, from four to ten lbs. weight. It is fit for use when full grown, before it begins to ripen; in that state it is known from the skin turning of a brownish colour, with external concretions of the juice.

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When ripe, it turns yellow and soft, to smell and taste sweet, by some esteemed as a fruit.

" The common and best mode of cooking it, is baking it entire as a loaf of bread, in an oven; or it may be sliced and toasted as bread without previous baking. Many like it boiled as a yam or potatoe; but, in short, it may be cooked as any esculent root. In a pudding it is excellent.

" The fruit has no seeds. Nature increases the plant by throwing up numerous plants from the roots, often at the distance of thirty or forty feet from the stem. They may be cut off when in height from six to twenty-four inches. Before that operation the part of the root cut off with the plant must have a few fibrous roots at it, the more the better; moist weather is the properest for doing it. After planting out of the plants, they should be sheltered a day or two with small branches of any thing that will keep the sun from them; all the large leaves ought to be cut off, as they immediately wither, and are apt to infect the stem. After they are rooted they are very hardy, and require no further attention unless defending them from cattle, as they are fond of the leaves and young tops. Rats are remarkably fond of them. When they arise to the height of ten or fifteen feet, care should be taken in clearing the ground around, not to destroy the buds on the roots which form the young plants. The roots destined by nature for their purpose, run horizontally on, or a little under the surface of the earth.

" The *East-India* kind was brought from Timor. It is a native of several parts of the East-Indies. Its habit is much the same as the former. The leaves are of a whiter colour, but the fruit differs much in size and shape. It is rough, the surface defaced, not of such a farinaceous substance as the Otaheitean, and at best a poor substitute for it. Like the former, it has no seeds, and like it, is increased by suckers.

" The *Seed-bearing* kind, or *Malabar Chesnut*, is also a native of the East-Indies and Ladrone Islands. It very much resembles the Otaheite Bread-Fruit, only its leaves are of a darker green and not so much cut, the branches more spreading. The fruit has prickles like the hedge-hog, and contains no esculent substance but seeds. They are nearly the size and shape of chesnuts, roasted or boiled, more farinaceous, and very nutritive. The negroes are very fond of them. This kind is propagated from its seeds only, as it throws up no suckers from the roots. The seeds vegetate in a few days, and must not be kept more than two or three days.

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"The fourth kind, or *Jucca Tree*, differs very much in its habit and fruit from the three former. It is an elegant tree, grows rather slower than the Bread-Fruit. The fruit is much esteemed in the East-Indies. It grows to an enormous size, but rough and ill shaped, the largest as yet known frequently forty or fifty lbs. weight. The fleshy part is yellow, very sweet, but not relished by palates unaccustomed to it. The seeds resemble those of the Malabar Nut, and are equally good. Propagated only from seed.

"All the four thrive in various soils and situations, but loamy seems the most congenial.

"*Cinnamon*, two kinds. It thrives in any soil or situation, and is remarkably hardy. It is propagated by seeds, cuttings, and layers. In four or five years from seeds, the primary branches are fit for barking. The best time for this operation is when the sap is ascending. The bark acquires the greater part of its strength in dyeing.

"*Cassia Lignea*, as yet doubtful whether a distinct species from the cinnamon or not; however, that now sent under that name, very different from it. The leaves taste and smell much stronger of the cinnamon than those of the former, and in culinary purposes are a good substitute for the cinnamon. The bark has very little of the properties of the true cinnamon, except that from the trunk and larger branches. This kind is propagated from seeds only.

"The *Clove* here requires shelter from winds and rains when young till four or five feet high. There is a great probability of its thriving in the Bahamas, as it does not agree with much moisture. It may be increased by layers. The leaves are a good substitute for cloves.

"The *Sago* is the hardiest of plants, and will grow among rocks, but grows very slow. It increases itself by suckers from the bottom of the stem.

"The *Mango* thrives best in a moist situation, not exposed too much to the wind. Raised from seeds only.

"*Malacca Apple*, a beautiful, fast growing, little tree. The fruit cooling and pleasant. From seeds.

"*Otaheite Chesnut*, a small tree, likes a rich and rather stiff soil. The kernel of the fruit eats like the Windsor Bean. Raised from seeds.

"*Otaheite Plum*, an elegant fast growing tree. The fruit in clusters like grapes, and much esteemed. Requires a soil the same as the chesnut. It is propagated by seeds and layers.

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"*Otaheite Walnut*, grows fast from seeds. The seeds used in Otaheite as a substitute for candles. Kernel esculent, as good as the walnut. It thrives in any soil or situation.

"*Otaheite Apple*, a large and fast growing tree, like the Hog-Plum, and produces very fine fruit in great abundance. It loves a good soil. Grows from cuttings and seeds.

"*St. Helena Almond*, grows very fast. Its branches extend horizontally a great distance, and form a fine shade. It thrives in any soil or situation. The kernel of the fruit small, but superior to the almond.

"The *Balsam Capivi* grows to a large, elegant tree. From the old trees the balsam exudes at certain seasons of the year, but in small quantity. It is chiefly obtained by tapping. It loves a strong clay soil, but will grow in almost any. From seeds only.

"The *True Quassia*, a valuable medicine, a small and elegant tree, will grow in sandy or rocky situations. From seeds only.

"To the *Gum Arabic*, your soil and climate are congenial.

"*Turmerick* increases itself rapidly from the roots. A common garden soil the best. The roots are dry for use when the leaves decay, like the ginger. Increased by roots.

"The *Tick*, or East-India Oak, loves a strong clayey soil. It grows to a large tree. The most durable and hard of woods.

"*Tobago Nutmeg*, is a bastard species. The nut tastes a little of the spice, the mace less. The juice of the tree is used on the continent in medicine and œconomy. It is an elegant tree, loves a low moist soil. It is not impossible but it may be improved, and acquire more of the Aroma, by change of climate and soil. The plants should be planted not far from one another, as the male and female flowers are in different individuals.

"The *Tea Plant* will thrive with you, if a rather moist soil can be found for it. It is increased from cuttings. The plants now sent should be kept in the boxes in a shaded situation, and watered every evening in dry weather, until they have pushed young shoots from two to three inches long, when they may be planted.

"To the *Olive*, the climate and soil of the Bahamas must be congenial. To be treated as the tea.

"*Tobago Bread-Nut*, an elegant and fast growing tree, requires a moist soil; the seeds equal to an Irish potatoe. From seeds only.

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"The *Aloe*, I should think, will be at home in the Bahamas, and may be rendered an useful production. It increases itself fast by suckers.

"The *St. Lucia Bark* requires a moist soil. It is a most beautiful tree, nor is there any doubt but its bark in many cases is superior to the Peruvian.

"*Arrow-Root*, very valuable; it increases fast by roots. Your islands probably are already full of it.

"*Otaheite Dye*, a handsome shrub, grows fast from seeds.

"*Sapindus* or *Letchee*, grows to a large tree, the fruit much esteemed by the Chinese, requires a rich soil. It propagates itself by suckers from the roots.

"*Gooseberry Tree*, grows fast. It is handsome, and yields an astonishing quantity of fruit; the fruit is excellent for tarts and for pickling. From seeds only. It thrives in any soil or situation.

"The *Cucumber Tree*, handsome, always in flower and fruit. The fruit sliced, with salt and pepper, not a bad succedaneum for cucumber; a strong, pleasant acid, makes an excellent pickle. From seeds. A garden soil best.

"The *Beetel*, or *Areca-Nut*, an East-India luxury, but a beautiful palm, grows fast, and will thrive in the Bahamas.

"*Simgraub*, a tolerable large tree; a rather moist soil and low situation best. By seeds only.

"The *Vanilla* must be planted at the root of a large spreading tree. The more moist the situation is the better. Readily increased by cuttings.

"The *Sweet Potatoe*. The best kind in these islands, very productive; any part of the stems grow. A light or sandy soil the best.

"The *Galengal* increases itself from the roots, like the Turmerick; any soil will do.

"The *Otaheitean Plantain* is superior to the common Plantain of these islands, requires a sheltered situation; the moister the soil the better.

"The *Lemon-Grass* will thrive remarkably well; well known in the Materia Medica as a medicine. Increased from slips.

"The *Bourbon Cotton*. The plant red, the cotton very fine.

"The *Contrayerva* delights in light sandy soil. Increased by slipping the roots.

"The *Eye Vine*, a climbing plant, should be planted at the roots of trees or sustained by poles. The juice of the cortical

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part of the root, from two to three drops into the eyes, an effectual remedy in the most violent inflammation. From seeds.

" The *Paraguay Tea* will thrive in any common soil. Increased by suckers.

" *Garden Balsam.* Syrup or decoction sweetened, valuable in colds and coughs, and all complaints of the breast. The leaves bruised cure fresh wounds. Readily increased by slipping the roots.

" *East-India Ipecacuanha*, a climber, will require poles; the roots a medicine for asthma. From seeds and slipping the roots.

" *Black Pepper*, so far doubtful whether the true or not, must be planted at the roots of trees. From cuttings.

" The *Beetel Plant*, to be treated as the former.

" The *Long Pepper*, ditto.

" The *Pareira Brava* requires poles.

" *Cochineal Plant.* A leaf cut off and put on the ground grows. It is the receptacle and nourishment of the Cochineal Insect.

" The *West-India Snake-Root* is a valuable medicine, possessing nearly the same virtues as the Virginian. Increased by slipping the roots.

" *Allamanda*, is an elegant ever-flowering shrub; infusion of the leaves a cathartic; a moist soil the best. Increases by suckers.

" The roots of the *Otaheite Potatoe* resemble the common or Irish Potatoe. In Otaheite they reduce them to a farine or powder, before they are esculent; when boiled entire they are better. From roots.

" The *Noyeau Plant* is propagated by cuttings and seeds."

10. *Remarks on the trees and plants sent by Mr. Anderson, which are now alive and thriving in the Bahamas.* By this it appears that two kinds of bread-fruit, sago, mango, Otaheite chesnut, apple and walnut, St Helena almond, quassia bitter, Tobago bread-nut, arrow-root, gooseberry tree, cucumber tree, lemon-grass, true cinnamon, European olive, cochineal cactus, mimosa gum-arabic, black pepper, and some others have succeeded and are growing in the Bahamas.

From this favourable specimen of the society's labours, we augur a continuance and extension of them, and on a future occasion we shall feel much pleasure in relating their successful progress.

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ART. IV. *Discurso sobre el Origen, Progresos, Metodos Curativos, y Demas Circunstancias relativas a la Enfermedad Maligna Contagiosa acaecida en la ciudad de Cadiz desde Principios de Agosto hasta fines de Octubre, Ano de* 1800. *Por un Apasionado a la Medicina;* i. e. *A Discourse on the Rise, Progress, Manner of Treating, and other Circumstances relative to the Malignant Contagious Sickness which happened in the City of Cadiz from the beginning of August to the end of October, of the Year* 1800. *By a Lover of Medicine.* 12mo. pp. 47. *Cadiz.* Murguia.

CADIZ has furnished a small publication, which we notice on account of its connection with the yellow fever in that city, which was described in Med. Rep. vol. v. p. 103.

After some introductory remarks, the writer of this little tract proceeds to give his opinion, that it was not a local or stationary epidemic (p. 13); that it began in the street called Sopranis, and spread far and wide from that place, as from a centre (p. 14); and "that positive facts prove that the sickness had nothing *stationary* [local] in its origin; but that some foreign morbific body, of an intensely active and contagious quality, produced, in this neighbourhood, the malignant, putrid, contagious calenture, which, as well by the rapidity of its career as by the gradation of the symptoms, allowed no time for the true professors of the art to correct the disorders which it produced." (p. 15). He confirms the account of the symptom of black-vomiting.

He then considers the dejection of mind, and the want of articles for food and clothing, the common attendants on sieges and blockades, as co-operating causes. He mentions the great rains which prevailed in January, and during the spring; and the strong easterly winds which continued during the whole summer. Notwithstanding all these coincidences, he still has recourse "to a morbific foreign body, of a prodigiously contagious power, which altered the natural constitution and state of health that the inhabitants enjoyed," &c.

From the tenor of the piece, we perceive that the writer, who, by the bye, conceals his name, combats the prevailing opinion, or "easy belief," in Cadiz, which is, that the distemper was local, and proceeded from changes wrought in the physical qualities of the atmosphere, and from the pas-

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tions of the mind then prevailing among the inhabitants:* and we regret that he has not been more usefully employed. His labours, however, are neither so long nor so dull as some of the contagionists in the United States. We hope, for the comfort of the Cadizians, he does not fatigue them so often.

But he does not pretend to explain how the spark of contagion was introduced. He has not a word of the tale about importation from the Havanna. In short, like the rest of the advocates of the same doctrine, he makes a very poor story of it. He affirms, however, one fact perfectly conformable to our own experience in America, that the people who were out of the city, and had not suffered the disease, were attacked, on their return to their houses, with such violence, that a large proportion of them were killed (p. 38). The rest of this short pamphlet we pass over as containing nothing particularly memorable.

ART. V. *Histoire des Chênes de l'Amerique, ou Descriptions et Figures de tous les Espèces et Varietès des Chênes de l'Amerique Septentrionale, Considerès sous les Rapports de la Botanique, de leur Culture et de leur Usage. Par* Andrè Michaux, *Membre Associé de l'Institut National de France, de la Societè d'Agriculture de Charleston, Caroline Meridionale, &c. that is, An History of the Oaks† of America, or Descriptions and Plates of all the Species and Varieties of Oaks in North-America, considered Botanically, Agriculturally and Economically. By* Andrew Michaux, *Member of the National Institute of France, of the Agricultural Society of Charleston, South Carolina, &c. &c.* Large folio. Crapelet. *Paris.* 1801. *With thirty six fine Copperplates.*

ONE of the establishments which gave splendour to the late monarchy of France, was that of botanical gardens in various parts of her colonies and of foreign countries. A piece

* "Manifestado el que no aparecen razones convincentes para la *crumcia facil* de que la calentura maligna, pútrida padecida fué estacional, ó proveniente de la alteracion de las qualidades sensibles del ayre, y pasiones de ánimo, solo queda el recurso de pasar á la investigacion de si fué originada de las qualidades insensibles de aquél, ó de algun otro principio no residente en aquellas," &c. &c.

† The North-American oaks had been partially described as long ago as 1771, by a careful observer: this was JOHN PHILIP DU ROI, who published his observations in two volumes octavo, at Brunswick in Germany.

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of land, of moderate fertility and extent, hired or purchased by the government, served in the distant country where it was situated, as an home for a botanist, a repository for the seeds he might collect, and a nursery for the plants he should cultivate. Men of science are seldom avaricious. Devoted to nature, they have ordinarily but few acquired or artificial wants. A moderate provision contents them. A salary which would appear trifling and inadequate to the support of a luxurious person in fashionable life and in a great city, is amply sufficient for the sustenance and support of a student of natural history, devoted to the objects of his mission, and dwelling among forests, and plants, and trees, in rural simplicity.

It is almost incredible how much good may be done in this way by a government, at a very trifling or insignificant expense. The whole establishment of such a man would not require more for ten years, than a minister plenipotentiary, or an envoy extraordinary, consumes in one. And for this compensation, small as it is, the botanical missionary transmits to the country which employs him, the vegetable productions, seeds, seedlings, herbariums, and specimens of all kinds, from the region in which he resides; thus at once gratifying rational curiosity, and enriching his native land with the useful and valuable species of the remotest islands and provinces of the earth.

The superb and elegant work before us is one of the products of two botanical gardens and farms which the late King of France had provided, one in Bergen county, within eight or nine miles of the city of New-York; the other in South-Carolina. This resident and pensioner was the diligent and accurate MICHAUX, the author of this History of American Oaks. And while our native citizens are ignorant or incurious of the leafy tenants of their forests, the more enterprizing and industrious sojourners from foreign countries discover, describe and arrange them, and teach us how to know and understand them.

It is matter of scientific gratification that this botanical institution was not ruined by the dissolution of the monarchy. Mr. Michaux did indeed return to France, with his collection of treasure, since the revolution began; but he was immediately employed by the government to accompany captain Baredin on a voyage to the South-Sea. And his report and collection of North-American productions were deemed so ample and complete, that Mr. CHAPTAL, the minister of the interior, has thought it no longer necessary to support these foreign institutions, as their main object has been fully answered and ob-

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tained already. How differently nations act! France has employed Michaux for many years, until the work in which he was engaged was done: about four or five twelvemonths ago Mr. MASSON passed through New-York, on a mission from Great-Britain to explore the botanical productions of Canada; and yet, with these examples before them, so laudable and so worthy of imitation, not a single botanical garden or mission has ever been established by any public authority, political or academical, that we have heard of in America. We hope this reproach will not attach long to the United States.

During his tours and expeditions through the woods, among numberless other things, Mr. Michaux availed himself of the opportunities which presented themselves to gain an acquaintance with the numerous species and varieties of *oaks*. The exceeding importance of this genus of plants recommended it to his notice, and he has applied a large share of his excellent and discriminating botanical talents to render the history of the *quercus family* as plain as possible. Indeed, so complete does it seem, that the professed phytologist will have little to wish for in future, than to traverse the swamps and the wilderness, and see in their native situations, in all their circumstances of vigour, soil and season, the living productions which Mr. Michaux has so faithfully delineated in his book.

But it is time to introduce our readers a little more particularly to Mr. Michaux as an author: this we do by presenting them with a translation of part of his introduction, where he gives some account of the *natural* history of the oak. (Introduct. p. 4).

"The oak grows naturally in all parts of the temperate zone, in Europe, in Asia, in America, and even in Africa. The cultivation of it requires peculiar care, as transplanting, grafting, and other means of reproduction, are not always favourable to it. Nature has particularly formed this tree for vast forests. There it reigns sovereign over the other vegetables, and furnishes abundant nourishment for animals of different natures. In Europe, the deer, the squirrel, and the wild-boar, live during the whole winter on the acorns of our woods; in Asia the pheasants and wild pigeons share them with the beasts; in North-America, the bear, the squirrel, the pigeon, and the wild turkey, are fed also by the nuts of the oak. Several sorts of quadrupeds and birds on that continent, after having consumed the fruits of a territory, emigrate in innumerable flocks and droves to regions where these productions are more plentiful.

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"Of all the trees, the oak is that whose timber is most generally and most advantageously employed. It serves for the construction of houses and of ships, for instruments of husbandry, &c. it affords articles useful in medicine; it is of almost indispensible necessity to the tanner, the dyer, &c. indeed, it is the daily support of fire, so necessary to our existence.

"The oak family comprehends a great number of species which are not known; and the greater part of those which grow in America appear under such diversified forms when they are young, that we cannot be certain what they are until they have arrived at maturer age, or have got their full growth. It seems that nature has intended to multiply this tree, and render it of general utility, by causing to grow in the same latitudes various species which could accommodate themselves to the diversity of temperature and soil. For the oak does not always grow in the forests, nor elevate its top to a very great height. There are places which produce nothing but dwarf oaks, such as the *kermes* oak (quercus coccifera), and some others, which are naturally small; while there are others which grow among the rocks, on the shores of the Mediterranean Sea, whose moderate height is owing merely to the dryness of the soil where they have taken root. There are also some varieties produced by causes purely accidental; in North-America there is a dwarf Scion-bearing oak (chênes nains stoloniferes), whose multiplied suckers cover vast tracts of country. The meadows (savannas), situated in the middle of the forests of this continent, are burned annually by the savages and by the new settlers, for the purpose of renewing the grass, attracting deer, and pasturing their cattle. The fire spreading thence into the woods and destroying the great trees, the horizontal roots of several species of oak detached from the trunk, reproduce by themselves, and separately, shoots which produce fruit afterwards when not more than two or three feet high. Every bundle or assemblage of these shoots, from the same root (souche) may be considered as a dwarf-tree, or without a stem, (tige); for the fire, in consuming these trees down to the root, produces the same effect that the cutting off the stem and trimming does in cultivated pear-trees, which otherwise would have become tall trees, but which, by these repeated operations, are made to remain dwarfs, and to put forth fruit-bearing branches near their very roots. Several travellers not having had time to observe these oaks with sufficient care, have taken them to be particular species; but those whose acorns have been planted,

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have sent forth, like all others, a descending root, without producing suckers; whence it seems probable there are no stoloniferous oaks.

"Oaks present numerous *varieties*, and the determination of the *species* to which they belong is attended with great difficulties. Frequently an intermediate variety appears so to approximate two species, that it is hard to determine, from an examination of the leaves, to which of the two species the variety ought to belong. Some species, apt to vary during their tender age, appear then so different, that the characters of the foliation are insufficient to determine and recognize the same species in young and old individuals. Several others, on the contrary, are so exactly uniform that the specific distinctions can only be established on the fructification, which is itself subject to exceptions and variations. It is only by comparative observations on individuals, considered both when grown and growing, that we can arrive at the distinction of the species that resemble each other so nearly, and at the distribution of the varieties to their proper species when found.

"The description of the oaks of North-America has been hitherto obscure, for several reasons: 1. The botanists who have visited those countries have given but detached observations upon those trees, and have not attended sufficiently to the characters of the fructification: 2. The authors who have treated on those subjects after them, have often united several species under the same denomination: and, 3. The figures they have given of American oaks, cultivated in Europe, are not always correct, because their growth there is retarded by a temperature, which is less favourable to them than their native land, and because they there preserve longer the varieties of foliation, which characterize their growing state.

"To clear up my doubts, I have planted and cultivated, during my residence in America, all the species which I have had opportunity to observe and collect; and after two years, I had the satisfaction to recognize all the varieties which had perplexed me so much when I traversed the woods."

The species and varieties which Mr. Michaux describes are *twenty-nine;* and the arrangement of them he has made out in the following manner; to wit:

Methodical Disposition of American Oaks.

Section I.

Quercus, foliis adultæ plantæ muticis; fructu pedunculato; fructificatione annua:—Specie 6^ta^ bienni.

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Division I.

Foliis—lobatis.

Sp. 1. Q. Obtusiloba—upland white-oak—iron-oak.
2. Q. Macrocarpa—over-cup—white-oak.
3. Q. Lyrata—water white-oak.
4. Q. Alba—var. *pinnatifida.* } White oaks.
——— *repanda.* }

Division II.

Foliis—dentatis.

Sp. 5. Q. Prinus—var. *palustris*—swamp chesnut-oak.
——— *monticola*—mountain chesnut-oak—rock-oak.
——— acuminata—narrow live chesnut-oak.
——— pumila—Chinquapin-oak.
——— tomentosa—Illinois-oak.

Division III.

Foliis—integris.

Sp. 6. Quercus virens—live-oak of Carolina.

SECTION II.

Quercus, foliis adultæ plantæ setaceo-mucronatis; fructu subsessili; fructificatione bienni.

Division I.

Foliis—integris.

Sp. 7. Q. Phellos—var. *sylvatica*—willow-oak.
——— *maritima*—sea-willow-oak,
——— *pumila*—dwarf-willow-oak.
Sp. 8. Q. Cinerea—upland willow-oak.
Sp. 9. Q. Imbricaria—shingle-willow-oak.
Sp. 10. Q. Laurifolia—swamp willow-oak.
———obtusifolia.

Division II.

Foliis—breviter lobatis.

Sp. 11. Q. Aquatica—water-oak.
Sp. 12. Q. Nigra—black-oak.
Sp. 13. Q. Tinctoria—var. *angulosa*—great black-oak—Champlain black-oak.
——— *sinuosa*—quercitron-oak.
Sp. 14. Q. Triloba—Downy black-oak.

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Division III.

Foliis—profunde multifidis.

Sp. 15. Q. Banisteri—running downy-oak.
Sp. 16. Q. Falcata—downy red-oak.
Sp. 17. Q. Catesbæi—sandy red-oak.
Sp. 18. Q. Coccinea—scarlet-oak.
Sp. 19. Q. Palustris—swamp red-oak.
Sp. 20. Q. Rubra—red-oak.

We have been the more particular to exhibit this systematic arrangement of the oaks, because we believe it will be welcome to our readers, and enable them the better to understand this difficult genus of plants. To the botanist this volume must be a rare treat: and the husbandman, and even the political economist, may peruse many of the descriptions with advantage. As a proof of this, we refer them to the account Mr. Michaux has given of the live-oak of the Southern States; a tree which, on account of the extraordinary durability and strength of its timber, is of unspeakable value to the country—though, alas! wastefully destroyed, and not protected as it ought to be by the proprietors, the States, or the nation.

Mr. Michaux recommends the cultivation of it on the sandy coasts of France, bordering on the Mediterranean Sea and the Atlantic Ocean.

ART. VI. *The Chemical Pocket-Book, or Memoranda Chemica, arranged in a Compendium of Chemistry, with Tables of Attractions, &c. calculated as well for the occasional Reference of the Professional Student, as to supply others with a general Knowledge of Chemistry. With the latest Discoveries. By* James Parkinson. *To which is added, an Appendix, containing the principal Objections to the Antiphlogistic System of Chemistry. By* James Woodhouse, *M. D. Professor of Chemistry in the University of Pennsylvania, &c. With Copperplates.* 12mo, pp. 215. *Philadelphia.* J. Humphreys. 1802.

BOOKS, it has been said, are multiplying so fast, that their number perplexes and bewilders the inquirer. On some subjects this is an inconvenience seriously felt and complained of. But chemistry has little cause, as yet, to lament the in-

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crease of vain and useless volumes. A science whose principles are of such extensive use and application as this, admits of wide and various discussions. For it may be considered as less a science by itself, than an assemblage or cluster of sciences. This is so remarkably the case, that to chemistry belongs, more than to any other department of human knowledge, the epithet of "*scientia scientiarum*," the science of sciences.

Herein the progress of discovery is so rapid, that a frequent revisal of what we have learned is necessary, that we may the more correctly adapt the new to the old. Besides the stock of facts which is thus daily accumulating, new language, new opinions, and new arrangements, are, from time to time, offered, both by the ingenious speculator and the sober interpreter of nature. These it is becoming and needful for the young student to become acquainted with immediately, and the more advanced one to add to his former acquirements as easily and as conveniently as he can.

From a perusal of the book before us, we have no reason to complain of the author for having compiled and published it. On the other hand, Mr. Parkinson has offered to his readers a handsome collection of "chemical memorandums," which the unlearned may peruse with instruction, and even the learned consult with pleasure. It seems to us likely that this manual of facts and doctrines was serviceable in Great-Britain, and we congratulate our scientific friends on its republication in America. Such a familiar, and, at the same time, comprehensive view of chemistry, must operate as a strong encouragement for the tyro to begin, and for the adept to continue his researches through this beautiful and boundless field of nature.

Mr. P. does not aim at novelty: his humbler, and, perhaps, more useful purpose, is to give a display of the present state of the science. With this intention, he has gathered from distant and respectable sources the most important information he could find. This he has extracted from the different essays, memoirs and tracts which he met with in reading, and has digested into short but perspicuous paragraphs. And, that he might deal fairly with his reader, he has very often quoted his authority for the information he presents. *Suum cuique tribuere* appears to have been the sentiment which governed Mr. P. while he was engaged in this performance; for he liberally ascribes to their proper authors a great proportion of what he has collected and arranged. His book, therefore,

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answers the double purpose of an abridgement of the modern chemical doctrines, and an index where the materials at large are to be found.

The method which he has pursued differs considerably from that of the French table of the nomenclature. This is the more a matter of surprise, as he appears to be a decided antiphlogistian, or disciple of the Parisian school. After giving a definition of the science, and an explanation of attractions, he proceeds to treat of the "earths:" of these he enumerates *nine;* to wit, *lime, magnesia, alumine, silica, baryt, strontia, jargonia, glucine,* and *augustine.* After these follow the doctrines concerning *caloric,* which we observe to be placed first in the catalogue. Then succeeds the history of *light, oxygen, hydrogen,* and *nitrogen,* with their modifications. On the two latter of these we remark, *en passant,* that it would be better to assume the term "*phlogiston,*" for the base of inflammable air and of water at once; and that the retention of the uncouth and ill-devised word "*nitrogen,*" which is infinitely worse than *azote,* will always exert a baneful and unhappy effect upon the science. Both "hydrogen" and "nitrogen" ought to be instantly discarded by all who understand the nice connection that exists between language and logic. And we predict that misconceptions and disputes will obscure and embitter these departments of chemistry until the phraseology is changed.

The three alkalies, *ammonia, pot-ash,* and *soda,* are next considered; and this prepares the way for an account of so many of the *neutral salts* as are formed by combination with the *nitrous* and *nitric* acids. Having given this, he treats of *sulphur* and its combinations, before and after oxygenation; of *carbone,* in its pure, oxydated, and acidified states, and of its junction with other bodies into *carbonates;* and of the *muriatic, boracic,* and *fluoric* acids, and their combinations.

Metallic substances follow: of the metals he reckons *twenty-one;* viz. *platina, gold, silver, quicksilver, copper, iron, lead, tin, zinc, antimony, bismuth, cobalt, nickel, manganese, uranite, tellurite, titanite, chrome, arsenic, molybdenite,* and *tungstenite:* and, connected with these, he treats of *Galvanic electricity;* and afterwards of the *bituminous* bodies, *petrol, mineral tar, asphaltum, amber,* &c. These observations are succeeded by remarks on *geology,* the *primeval state of the earth,* its *alterations in the course of time,* and on *volcanic productions.*

Vegetable and *animal substances* are treated of next, and,

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under the former, *fourteen* acids are named; such as the *citric*, *malic*, *gallic*, *benzoic*, *tartarous*, *oxalic*, *camphoric*, *suberic*, *pyrotartarous*, *mucous*, *pyromucous*, *lignous*, *pyrolignous*, and *acetous*; and, under the latter, *nine* acids, the *lactic*, *saccholactic*, *sebacic*, *phosphoric*, *uric*, *prussic*, *bombic*, *zoonic*, and *formic*. Lastly, he has added Sir Torbern Bergman's tables of single elective attractions, as revised by Dr. G. Pearson, and commented on by the Reviewers; and Mr. Kirwan's tables of the proportions in which alkalies and earths are found to be united, and are capable of uniting with acids, and *vice versa*.

Notwithstanding the pleasing and sententious manner in which Mr. P. has executed his undertaking, there are some parts in which correctness of statement and pertinency of application seem to have failed him. As an example of this, we offer his remarks on animal putrefaction, which close the work.

"Every animal body, when deprived of life, suffers a gradual decomposition or resolution, which is effected chiefly by the access of air, aided by a due degree of moisture and of heat. Its colour first becomes pale; its consistence diminishes; its texture is relaxed; and a faint and disagreeable smell is emitted. The colour at this time changes to blue and green, the parts become more and more softened, the smell becomes fœtid, and the colour of an obscure brown. The fibres now yield, the texture is more resolved, the putrid and nauseous smell is mixed with a smell of a more penetrating kind, arising from the disengagement of ammoniacal gas; after this the mass becomes of still less and less consistence, the smell more faint and nauseous, and the effluvia exceedingly active and injurious, arising, it has been said, from the separation of phosphorated and carbonated hydrogen gas; a separation of phosphoric light taking place at the same time. When it has continued in this state some time, the mass again swells up, and carbonic acid gas is separated: this part of the process is protracted for some time, when it changes into a soft putrid mass.

"A great part of the hydrogen, and the remaining carbon, with the other fixed radicals, now gradually form a dark, brown, soft, earthy matter. This result forms *soil*, which, mixed with *mould*, the remains of vegetable putrefaction, forms the common receptacle for the roots and germinating seeds of vegetables.

"When this resolution takes place at the same time with

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vegetable matter, as in marshes, some portion of the hydrogen and phosphorus produce the *ignes fatui*, and such luminous appearances. If this resolution is accomplished in a confined place, a foul, *musty* smell is discoverable.

"Heat, moisture, and the access of air, should be avoided if it be intended to prevent this process from taking place. In one or other of these modes the various antiseptic processes act, such as covering with resins and balsams, drying, salting, and smoking, immersion in spirits, freezing water, &c."

This account has very much the air of having been copied from preceding writers. If it had been derived from Mr. P.'s *own* observation, we should have expected he would have *mentioned the formation of the septic acid, the mischief caused by it when it rises in vapour, the fixation of it by pot-ash, and the conversion thereby to salt-petre.* But he has only done as most others have done before him, the greater part of whom acknowledge that salt-petre derives its acid from putrefying substances, chiefly of the *animal* kind; and yet, through the most strange inadvertence, class this same sour offspring of animal corruption, when they obtain it under a new, mingled, and adulterated form, from salt-petre, by distillation, in a widely different part of natural and chemical history, and contend that it is a *mineral* acid. Mr. P. however, has conducted his description of the phenomena of putrefaction in a manner still more objectionable; for he has not vouchsafed to name the septic acid, or any of its effects or combinations. Such forgetfulness reminds us of the traveller who set out on a journey without adverting to the usefulness of money, and of the navigator that cast off from the wharf upon a voyage, and never thought of his anchors! For evidence on this head, we refer Mr. P. to Med. Rep. vol. iii. p. 307—310; to vol. v. p. 472; and to all the writers on the formation of salt-petre.

The agreeable and summary survey which Mr. P. has taken of these and numerous other subjects, recommends his work to the attention of those who wish either to acquire or to preserve chemical knowledge. And he who has a desire to make experiments will be further gratified by a print and description of the economical laboratory of Mr. Guyton, the experienced and able French chemist.

To this American edition, Professor Woodhouse has added a delineation and account of another economical apparatus invented by himself. The maker of experiments will find this to be simple, cheap, and applicable to a great variety of processes.

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And the same editor has also enlarged it with an account of the principal objections to the antiphlogistic system of chemistry. The learned and ingenious Professor avows, that after attending to the subject in controversy for several years, he has been obliged to give up certain parts of the new theory as untenable, and he now states some striking objections to it, which he thinks have not been satisfactorily answered. These relate chiefly to the airs produced by transmitting the steam of water over charcoal exposed to a red heat, and to the gases obtained by exposing metallic calces and coal to a red heat. But as the curious experiments on these points have been published at large in our vol. iv. p. 115—119, we shall not transcribe them, but refer our readers to the original passages.

We wish Mr. P. had seen the different volumes of the Medical Repository. In one of these Dr. Woodhouse's experiments were published, as long ago as August, 1800. Should it ever be his lot to read these observations on his publication, we hope he will be encouraged to examine that American work, in which we can assure him there are a number of *other* "memorandums," which appear to us equally worthy of a place in his useful and convenient "Pocket-Book."

ART. VII. *The Student's Chemical Pocket Companion. By* W. S. Jacobs, *M. D.* 12mo. pp. 114. *Philadelphia.* Conrad. 1802.

ANOTHER publication, of the same general scope and tendency with the one which has been considered in the former article, appeared in Philadelphia about the same time. A number of the observations offered on Mr. Parkinson's work as a guide and compendium of chemistry, apply to this performance of Dr. Jacobs; only it must be remarked that Dr. J.'s work is much shorter, less comprehensive, and destitute of the references with which Mr. Parkinson's abounds.

Dr. J. follows more nearly than Mr. Parkinson the established order of the nomenclature, though he also exercises considerable freedom in departing from that arrangement. In the rapid and broad survey he has taken of the subjects before him, he has attended more to the great outlines and divisions, than to matters of detail. To beginners it promises to be serviceable; though we recommend to the author the correction, in his second edition, of some errors which will

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occur to him on revising the sheets of the first. He affirms, for example, that sulphur (p. 3), and the metals (p. 54), are simple substances, though, in their ordinary states, they are evidently connected with phlogiston (hydrogen). In p. 77 it is written, that "the sulphuric acid attacks manganese, and produces *hydrogen* gas;" when, surely, *oxygen* was meant. We question the explicitness of the statement given (p. 21) of Dr. Mitchill's idea of pestilential air. That gentleman never said that we know, nor does he now affirm (though it has been incessantly and mistakenly ascribed to him), that any modification of the *artificial* nitrous acid of the laboratories is the mischievous gas which poisons the atmosphere in times of endemic fevers, &c. but he is convinced, from a most extensive induction of facts, that an acid gas, *naturally* and spontaneously exhaling from certain corrupting bodies (which gas he therefore calls the *septic*), sometimes contaminates the atmosphere, and renders it unwholesome; and that alkalies are its natural and best antidotes. This *septic* acid, when associated with alkaline salts and earths, forms the class of neutral compounds, which he thence calls *septics*. When these are analyzed, or resolved into their constituent parts by *forcible* means, by high heat, and by addition of stronger acids, &c. the specific form of the *septic* is so far changed and lost, that it appears under the disguise and modification of the *nitrous* or *nitric:* and such appears to be the true and methodical view of the matter. We have so entire an opinion of Dr. J.'s candour and discernment, that we entertain no doubt of his being convinced, from this view of the subject, how improper it is to class the "nitric" among the *mineral* acids; an inadvertency against which Mr. Parkinson has guarded himself.

But we shall close our criticism on this well-directed work of an amiable and valuable member of the scientific *corps*, by extracting his account of animal putrefaction, that it may be read in connection with Mr. Parkinson's.

"For this process, air, heat and water are required. The animal substance first acquires a faint and disagreeable smell; its texture becomes relaxed; its colour changes to a blue, then green, and becomes softer, more fœtid, and assumes a brown colour; next a putrid odour manifests itself, mixed with that of ammoniac. It loses its consistence; the carbonated phosphorated hydrogen, together with carbonic acid, are separated. It is now changed into a black fœtid mass, which forms a good manure when mixed with mould.

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"In the process of animal decomposition, the nitric acid is generated by the union of the oxygen of the atmosphere with a part of the nitrogen of the animal substance: while the hydrogen of the animal fluid, combining with another portion of the nitrogen, forms ammoniac, a portion of the oxygen unites with the carbon of the flesh, and forms the carbonic acid, which, with a part of the hydrogen, holding phosphorus in solution, are disengaged."

It will appear evident that these two descriptions are, with little material alteration, copied from the same originals. To determine what authors Dr. J. and Mr. Parkinson followed, we turned to Fourcroy's *Lecon's Elementaires*, &c. and to Chaptal's *Elements*, &c. and found all the descriptions of the phenomena in these authors so nearly alike, that we suspect they are not the results of original observation in either of them, but have been transmitted by one from the other, or compiled by both from preceding writers.

How else could it have happened, that no single man of them all, since the days of Beccher, who examined for himself, had observed the *sour* stage of animal putrefaction? Our women know that meat, in common house-keeping, will grow acid in the pantry and larder. Our inspectors of beef for exportation to foreign markets can smell and taste the sourness of that sort of flesh as it corrupts. Our hunters and travellers through the wilderness are afraid to boil the salted pork they carry in their knapsacks, on long and distant expeditions, lest it should turn sour, and therefore eat it raw. And our very laundresses are well acquainted with the acid smell of human clothing which has imbibed much perspirable matter. And yet the philosophers and the chemists pass over these memorable facts as if they were unworthy of regard, or rather as if they did not know them. We want more original observers. It is admirable how many descriptions, when once they get into print, are copied, and imitated, and abridged, and paraphrased, and garbled, by writer after writer. In the account of these phenomena, Dr. J. has the advantage of Mr. Parkinson, by his mention of the septic (what he calls nitric) acid. He mentions both this and ammoniac as the products of the process; but why did not this gentleman say, with Fourcroy, speaking of the *infectious* and *poisonous* vapour exhaling from corrupting bodies, "that this odour is corrected, and, as it were, enchained by volatile alkali?" *Cette odeur est corrigeè, et comme enchâinée par l'alkali volatil* (see El. tom. ii. p. 839); an expression full of truth and good sense.

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ART. VIII. *Reports to* Benjamin Stoddert, *Secretary of the Navy, on the Subject of Docks; and Remarks relative to the Ports and Harbours of the Eastern States. By* Joshua Humphreys. 8vo. *Washington.* Duane. 1802.

THESE valuable papers form part of a series of documents concerning the naval affairs of the United States, and were published, together with a number of others, by order of the House of Representatives. They are the result of an examination of the ports of New-London, Newport, Providence, Boston, Charlestown, Portsmouth, Portland, and Wiscasset, made by order of government, for the purpose of ascertaining the best places for navy-yards, and places of safety and rendezvous for ships. Mr. Humphreys received his commission early in the year 1800, and his report is dated April 19 of that year. It lay in the office of the Secretary of the Navy until January 30, 1802, when it was put into the possession of the committee for naval affairs, who directed their chairman, Dr. Mitchill, to move for an order to print it.

Mr. H. has added much useful and valuable matter to the knowledge we possessed of the coasts and harbours of Connecticut, Rhode-Island, Massachusetts, New-Hampshire, and Maine. Our maritime geography may be considered as being substantially improved by the survey he has made. The advantages and disadvantages of each port and harbour that he visited, are stated in clear, sententious and perspicuous terms. And such persons as wish correct information concerning these parts of the Atlantic coast, will peruse the pieces now under consideration both with pleasure and instruction.

To give our readers an idea of this rare pamphlet, we shall offer them Mr. H.'s remarks on Newport, and contrast them with those he has made on Boston, showing the conveniences and inconveniences of both.

"*Remarks at Newport.*

"ADVANTAGES.

"1st. Accessible at all times, especially when the wind is at north-west; which is the prevailing wind in the winter season.

"2d. A good channel, depth of water, still tide, and a capacious harbour, well land-locked, sufficient for the largest navy in the world; a good anchorage above the Dumplin

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Rocks, which is the proper place for ships to lay in; in fact, it is the best harbour for our navy I have seen.

"3d. Goat-Island, a suitable place for docks, and belonging to the United States, well secured from storms by its situation; and the most suitable place for a dock is the west side of the wharf.

"4th. Plenty of good materials for the docks.

"5th. A good dock for docking of timber.

"6th. Great advantage of being quick at or from sea, which may be in three hours.

"7th. The number of vessels belonging and bound east and west of this port, frequently make it, and wait for a wind to waft them to their respective ports. This was the case while I was at this port, and is the most decided proof in favour of it.

"It appears, from the best information I could obtain, that the east end of Long-Island is a desirable part of the continent to make coming on this coast, and is the land most generally made, and that it is an object that commands the attention of all seamen returning to any port east of the Delaware. From the land so made, a north-west wind is a fair wind into this port; but unfair for any other, neither can they make any.

"DISADVANTAGES.

"1st. The great expense to fortify this place, which may be estimated at more than one million of dollars.

"2d. The small rise of tide.

"3d. The probability of worms.

"4th. The difficulty of anchoring below the Dumplin Rocks, the water being deep and the bottom rocky."

"*Remarks at Boston and Charlestown.*

"ADVANTAGES.

"1st. The outer harbour of President and Nantasket Roads is large, and considered as a safe harbour for large fleets from the weather, when they are safe in and anchored.

"2d. Quick at sea from this place.

"3d. The inner harbour is very safe from the winds, freshes, and an enemy, and can be securely fortified at an easy expense.

"4th. Boston and Charlestown, both being situated on necks of land, can be securely fortified, and without very great expense.

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" 5th. The number of tradesmen within its vicinity, that may be commanded at all times in fitting and building ships of war.

" 6th. The number of seamen that resort to the port of Boston, which will always forward an expeditious equipment.

" 7th. The rise of tide, as it respects dry docks, which may be stated at eleven feet.

" 8th. The great number of militia that may be collected at a short notice, in case of an invasion, more than at any other place.

" DISADVANTAGES.

" 1st. The great fog that this coast is frequently subject to.

" 2d. The great number of shoals that are in and off the great bay, and the number of currents, which no experience can guard against.

" 3d. The difficulty of entering the harbour with the wind at north-west, which is ahead.

" 4th. The easterly winds, though fair for running in, are mostly attended with thick hazy weather; and the navigation of the bay being difficult, vessels are frequently compelled to stand out to sea.

" Mr. M'Lellan, an old, experienced commander on the coast, and a respectable citizen of Portland, states, that at, and all to the eastward of Cape-Cod, the coast is subject to great fogs, which sometimes continue for fifteen days. It is also stated, in a chart of George's Bank, by Paul Pinkham, that it is the most dangerous coast within the limits of the United States, and which he fears has been fatal to many.

" 5th. That a French seventy-four gun ship was absolutely lost in going out of the harbour during the revolutionary war, and a British seventy-four gun ship at Cape-Cod.

" 6th. The harbour opposite the town of Boston is not sufficiently large to contain a large fleet; the channel being very narrow, so much so, that there was but just room for the Constitution to swing clear of the ground at low water, in consequence of which Capt. Nicholson thought it most prudent to drop the ship down to President Road (which is just below the castle) to take in his stores.

" 7th. The anchorage is bad, from the bottom being very hard above Castle-Island, so much so, that Capt. Nicholson also states, he was drove up and down the harbour by the ice, with two anchors ahead, which would not hold: this hap-

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passed some time since, though I suppose the ice cannot be so troublesome since the bridges are built.

" 8th. It is notorious that many vessels put into the Vineyard and Newport, and there wait a wind for Boston, which passage is considered as very dangerous. The difficulty of entering Nantasket Roads will be increased in crippled ships.

" 9th. It is stated that more vessels are lost in and near Boston Bay, than all the other parts of the coast of the United States.

" 10th. The fall of tide, as it respects shoals in the port or bay, as vessels may be affected by getting aground on hard bottom.

" 11th. To establish a navy-yard at Boston, the expense would be at least 48,000 dollars for the ground, and the place too much confined, and be very liable to be affected by fire; not only that, but you must lay your vessel in a northerly direction, subject to the cold northerly winds.

" 12th. Noddle's Island presents a westerly and northwesterly exposure, which is a very cold one, and the ground uneven. The most suitable piece of ground on this island, for a dock or navy yard, is said by the tenant to contain about 77 acres, upland and marsh. The owner demands 25,000 dollars for it.

" 13th. At Charlestown and Noddle's Island there are long flats.

" 14th. Charlestown is the most suitable spot in the port of Boston for a building yard."

After having described, after this manner, all the ports before mentioned, he concludes with these remarkable observations: (p. 40).

" Having compared and considered the advantages and disadvantages of situation, with capacity of harbour, depth of water, rise of tide, expense in building docks, prices of land, facility of navigation, and capability of defence, previously stated, at each port, I am decidedly of opinion, that Newport (Rhode-Island) is by far the most suitable port for the establishment of dry docks, and great naval port for our navy, for the ease and safety of entry at all seasons of the year. Its eligibility in preference to any other eastern port is universally acknowledged.

" The principal and only objection is the great expense of fortification, which may amount to more than a million of dollars.

" Boston harbour has been preferred by some; but experience has shown, that, during the late revolutionary war, a

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French and an English seventy-four gun ship were both lost in Boston Bay, which are evident marks of its dangerous coasts and harbours. Neither money nor art can ever alter the winds, dispel the fogs, and remove the currents or shoals which are attached to Nantasket Road and coast. The amount of loss on those two ships would, I suppose, pay from one half to two thirds of the cost of fortifying Newport. Upon comparative accidents which have happened, and the causes still existing, it is fair to calculate upon what may take place in future. I am justified in this conclusion by the mode pursued by the underwriters, who calculate their premiums by the experience they have gained from what has passed; from which it is prudent and justifiable to calculate a continual loss equal to the cases stated, and in an increased proportion as our navy becomes more numerous.

"How different is Boston port compared with that of Rhode-Island, where you have no reason to calculate a single loss in a century!

"During the late war, the enemy, by taking possession of Rhode-Island, cut off the communication, in part, between the Eastern and Middle States. To guard against this in future, it may be doubted whether the navy and dock-yards will call for any important additional expense for fortification, further than for general defence, as there is no situation within the United States more convenient to favour the depredations of an enemy than Rhode-Island, nor from which our trade would be more liable to destruction from the excursions of their cruisers.

"The united interests of the States render this one of the most important ports for the attention of government.

"I cannot close this report without stating the propriety of fortifying the most suitable places for the protection of Gardiner's Bay, to prevent an enemy from taking possession of it."

Besides the kind of information, of which we have given these entire extracts, the report of Mr. H. abounds with facts and intelligence concerning distances, courses, depths of water, and directions for sailing, highly reputable to himself, and useful to the geographer and political economist. But, after having gone thus far, we must stop, and not transgress our critical limits.

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ART. IX. *Naval Regulations, issued by command of the President of the United States of America, January 25, 1802.* 12mo. pp. 36.

BY virtue of that power contained in the second section of the second article of the Constitution of the United States, which declares the President shall be commander in chief of the army and *navy*, and in addition to, and in conformity with the rules and regulations contained in an act for the government of the navy, passed March 2, 1799, this collection of private directions for the preservation of discipline, and the good of the service, seems to have been compiled. The eleventh section of that statute recognizes this right in a commander in chief or captain, provided the rules they adopt are not at variance with that law, nor with the maritime usages most common to our nation.

The contents of this work are digested into distinct heads, treating severally of the duties of a commander in chief, captain, lieutenant, sailing-master, surgeon, chaplain, boatswain, gunner, sail-maker, armourer, gun-smith, carpenter, master at arms, corporal, midshipman, and cook. To these short preceptive chapters are added regulations to be observed respecting provisions, slops, forms for keeping log-book and journal, court-martials and convoys.

The greater part of these matters falling not within our province, we content ourselves with merely mentioning them in general terms. But as numbers of our readers, especially of the younger class of medical gentlemen, may be desirous of knowing the duty of a navy-surgeon, we extract the part which refers to him entire.

"*Of the Duties of a Surgeon.*

"1. To inspect and take care of the necessaries sent on board for the use of the sick men; if not good he must acquaint the captain; and he must see that they are duly served out for the relief of the sick.

"2. To visit the men under his care twice a day, or oftener, if circumstances require it; he must see that his mates do their duty, so that none want due attendance and relief.

"3. In cases that are difficult, he is to advise with the surgeons of the squadron.

"4. To inform the captain daily of the state of his patients.

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"5. When the sick are ordered to the hospitals, he is to send with them to the surgeon an account of the time and manner of their being taken ill, and how they have been treated.

"6. But none are to be sent to sick quarters, unless their distempers, or the number of the sick on board, are such that they cannot be taken due care of; and this the surgeon is to certify under his hand, before removal. If the surgeon of the hospital finds they might have been cured in a little time on board, the surgeon of the ship is to have charged against his wages, for every man so sent, ten dollars.

"7. To be ready with his mates and assistants in an engagement, having all things at hand necessary for stopping of blood and dressing of wounds.

"8. To keep a day-book of his practice, containing the names of his patients, their hurts, distempers, when taken ill, when recovered, removal, death, prescriptions, and method of treatment while under cure.

"9. From the last book he is to form two journals, one containing his physical, and the other his chirurgical practice; which are to be sent to the navy-office at the end of every voyage.

"10. Stores for the medical department are to be furnished upon his requisition, and he will be held responsible for the expenditure thereof.

"11. He will keep a regular account of his receipts and expenditures of such stores, and transmit an account thereof to the accountant of the navy, at the end of every cruise."

We also insert the order concerning provisions that are about to putrefy on ship-board.

"In all cases where it may appear to the purser that provisions are damaged or spoiling, it will be his duty to apply to the commanding officer, who will direct a survey by three officers, one of whom, at least, to be commissioned."

We add the regulation for airing the hold.

"The decks or gratings are not to be scraped oftener than is necessary, but are to be washed and swabbed once a day, and air let into the hold as often as may be."

Among other marks of the sound sense and just consideration which dictated this manual of discipline, we remark that no fumigations are even mentioned. Vapours which deteriorate the air, without destroying any thing noxious which it contains, are most discreetly omitted. And such are the

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fumigations now or heretofore in vogue among some of the European nations.

The President *guards against all manner of nastiness*, and orders *the men and the ship to be kept always thoroughly clean*. And this, we say, is "the law and the prophets" on this subject.

Our work has exhibited frequent instances of sad and ruinous sickness arising within the public ships and merchant vessels. (See Med. Repos. vol. iv. p. 1, 234, 244; and vol. v. p. 70, 234.) We are satisfied that the commander in chief has hit upon the sound and proper *general* precepts; and, under that conviction, we published the correspondence and supplementary rules *for details* of service, in our vol. v. p. 455, which are too fresh in the memory of our readers to need repetition.

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MEDICAL & PHILOSOPHICAL NEWS.

DOMESTIC.

Law Case, where the Principle upon which the Action turns depends upon the Mode of preparing Pot-ash and Pearl-Ash from Wood-Ashes.

Vermont Supreme Court.—RYAN vs. TOUSEY.

THE plaintiff is patentee under the act of Congress for the privilege of converting alkaline salts of the first crystallization, commonly called "black-salts," by one operation in a furnace duly constructed and heated, into *pot-ash or pearl-ash of the first quality*. He sold his patent right, for the States of Vermont and New-Hampshire, to the defendant, for a sum of money payable in several annual instalments. In the transfer, Ryan warranted to Tousey, that, by adopting his process, a large and specified quantity of pot-ash or pearl-ash could be manufactured, and that the salts so procured would undergo inspection, and be merchantable alkalies of the first rates. In proceeding to prepare the salts by the prescribed mode, Tousey found he could, indeed, prepare the *quantity* mentioned in the contract, but that they were remarkably deficient in *quality*. Both inspectors and manufacturers complained of them as faulty and bad; whereby Tousey was disappointed in his expectations, and the license which he had purchased became of no value to him. In the mean time an instalment growing due, Ryan commenced a suit against Tousey for the amount: to this the defendant pleaded, that he ought not to pay the money, inasmuch as the plaintiff had not fulfilled the second condition of the warranty, and therefore, in fact, he had received no valuable consideration, the pretended patent privilege conveyed to him being worth nothing. The defendant asked counsel, and received the following

Opinion on this Mode of preparing Pot-Ash and Pearl-Ash from Wood-Ashes.

The whole weight of the evidence on this process goes to prove that these kinds of salts do not pre-exist in the wood or

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timber from which they are formed, but are produced during the act of burning, while the bodies of trees or other vegetable substances are converted to ashes. In order to procure them strong and good, the material of which they are formed should not be decayed or rotten, but sound and solid. Even then some sorts of vegetable substances yield a greater quantity and better quality of salts than others.

In the preparation, the manner of burning the wood is found to be of great consequence; for where the combustion has been conducted in a slow, imperfect, and mouldering way, the quantity and quality of the salts will vary from those obtained in a clear, brisk and strong fire.

Experience also has amply shown, that although these salts are the offspring of the fire, yet that fire may be so intense as to vitiate, and even destroy them. There can be no reasonable doubt that great quantities of the salts brought to market have suffered irreparable injury by having been exposed injudiciously to too long a continuance, and too high and unlimited a degree of heat.

Commercial men, and practical tradesmen, have, I think, more just ideas on these salts than the generality of men of science. Mr. POSTLETHWAITE,* for example, in his Universal Dictionary of Trade and Commerce, is decidedly of opinion, that there are many kinds of pot-ash, which possess as many different qualities. Mr. MORTIMER,† in his cele-

* *Extracts from Postlethwaite's Universal Dictionary of Trade and Commerce.*

He has no such article as "Alkali" or "Barilla." Under the title "Kali," in his first volume, he writes that *al*, in Arabic, signifies *salt*, and *kali* means *soude*, or soda; so that the word alkali is of the same import with *sal soda*, or salt of soda.

The greater part of the soda which comes from Spain is consumed at Paris and the neighbouring villages, by the scourers and whiteners, or bleachers, who use it to whiten their linen.

Pot-Ash. He thinks there are many kinds of it, which have as many different qualities. This is so much the case, that soda of Alicant is found to be best for making soap and bleaching, and that of Syria and Egypt for making glass.

† *Mercantile Opinions about Pot-Ash, from Mortimer's Dictionary of Trade and Commerce.*

Article *Nitre.* He mentions the idea of the nitre being, in part at least, if not wholly, a salt of animal, not of fossil origin, because it proceeds from the excrements of animals, and from the effluvia of the animals wherewith old walls have become impregnated. He quotes Hoffman's assertion, that it may be procured at any time by exposing an alkaline salt to the atmosphere, in a proper situation, covered over-head from rains and dews.—Mortimer's book was published in 1766.

Article *Pot-Ash.* He makes a distinction between pot-ash and mere

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brated Dictionary of Trade and Commerce, expresses clearly the sentiment, that though these salts are produced in the fire, they are also capable of being destroyed by fire. And in the famous suit brought by the bleacher at Paisley against the merchant of Glasgow, consignee of the shipper in New-York, for damages, by reason of the bad quality of the salts sold him, judgment was given in the court of Glasgow for the plaintiff, though the ashes which were the subject in dispute were of the sort called "furnace ashes," and were sold under an inspector's brand.

I was formerly inclined to think, that the faulty quality of "furnace ashes" (for every discreet person with whom I have conversed about it admits it to be very faulty) was chiefly to be ascribed to the accidental or intentional admixture of foreign ingredients; such as clay, lime, iron, common salt, plaster of Paris, flint, and other things with which melted alkalies will combine. I have expressed this opinion both in conversation and writing; and this opinion all my subsequent observation has confirmed. I, however, have this additional sentiment to express, that, independent of all casual combinations and designing tricks, these salts may vary in quantity,

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fixed alkaline salt. He affirms that pot-ash and pure fixed alkali are very different; and that the latter will not answer the purposes of the former in many of the manufactories. He has an idea that, during the exposure of pot-ash to the roasting or melting heat, it attracts some kind of acidity from the air.

Article *Alkali*. He affirms that vegetables which, if burned when sound, would have yielded alkaline salt, yield none at all when suffered to rot before they undergo the action of fire; says alkaline salts are as much the creatures of fire as glass is; that they are capable of decomposition; that they are by no means simple bodies, but are composed of different parts united together, which, when conjoined so as to appear homogeneous, owe their apparent simplicity entirely to the strength of the fire.

"Hence it also appears," says he, "that as these fixed alkaline salts are rendered more and more simple by a separation of their constituent parts, the salt that thus arises will be continually different; for that which remains after a separation of some of its principles, will always be of another and more simple nature, and, consequently, will have a different power of acting. Thus, in pot-ash which yields the best alkali, a considerable part of it is a bitter, hard, pellucid salt, which does not readily dissolve in water. If this be carefully separated from the rest, a pure alkali is obtained, fitter than the former, before this separation, for many operations which are performed by alkalies."

After mentioning adulterations, as with salt-petre and sea-salt, he adds, "that the very burning of vegetables, as it is performed in a different manner, will produce different salts; for it is a known truth, that if the same vegetable is burnt suddenly in a brisk, strong fire, it will yield a salt different from what is produced by burning it in a slow smothering fire."

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and be defective in quality, from three causes: 1. The original constitution of the vegetable. 2. The manner in which it was burned to ashes. And, 3. The process by which these were converted to black salts, and these latter into pot-ash and pearl-ash: so that my strong conviction is, that even where no fraud is practised, and no adulterating material is added, both pot-ash and pearl-ash may be found wanting in those peculiar and active qualities for which manufacturers and tradesmen employ them. In such cases the cause of the mischief appears to be excessive heat. The salts, if I may use the expression, are burned to death.

In the case depending between Ryan and Tousey there has been an apparent deception on both sides. The patentee and the assignee seem not originally to have been aware of the destructibility of these salts by intense violence of fire. The process of the former, while it produces a large *quantity*, ruins its *quality*. The latter having purchased the license with a warranty, that, by following the specified mode, he should manufacture salts of the first quality, has been deceived and disappointed by reason of the patentee's having promised what it was *impossible for him to fulfil or perform*. For by this process it is impossible to produce the articles of those prime and first-rate properties. Upon what principle, then, can Tousey be compelled to pay a solid compensation for the *nullity* or *impossibility* warranted by Ryan?

SAMUEL L. MITCHILL.

East-Rutger's-street, June 20, 1802.

SHIPS THE MANUFACTORIES AND VEHICLES OF PESTILENCE.

In our vol. v. p. 70 and 234, the facts were detailed concerning the *importation* (as the contagionists call it) of a destructive sickness repeatedly into New-York, from several ports in Ireland. The American cities have suffered more calamitous visitations from that country than from all the West-India Islands put together. And, according to the contagious doctrine entertained and propagated by some Hibernian gentlemen of the medical profession, whose published opinions we have read, Ireland ought to be considered, in every American sea-port, much more productive and abundant of contagion than any region on the globe.

But there is no need of affirming the contagiousness of fevers, or their importation either from Ireland or the West-Indies. It is sufficiently understood, that poison is *engendered*

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in such ships from Ireland as those alluded to above, and in a greater part of those returning in a state of horrible nastiness from the West-Indies; and that this *inbred mischief* has no reference to any particular city, port or country which that ship may have visited. Bred in the ship, and belonging to her, and *locally* appertaining to her, the poison is carried along wherever she goes. Such a ship is a direful nuisance; and yet such nuisances are very common. And, by a most unhappy mistake, the *pestilence manufactured and inherent in the ship*, and transported within her to whatever place she may be destined, is ever deemed to have been taken on board at the place she last left; when, in fact, that place has nothing to do in the business.

To candid examiners, the fact now to be related conveys deep insight into this matter. One of the before-mentioned pestilential ships from Ireland, too nasty and too poisonous to be suffered to approach the city of New-York, was detained at the quarantine station near Staten-Island. After the survivors of the wretched passengers and crew had been landed, and the decks washed a little, the owner of the ship made application to the health-officer for a permit to take her up to the city. This the health-officer resolutely refused, alledging that she was too foul and pestilential to go any where, and that she must remain where she was, and be scrubbed and scoured out.

The owner grew angry at this, on account of the *expense* and *delay* requisite for cleaning the ship properly, and peremptorily demanded her release. To this the health-officer replied, that she should never go to that city in her present state of impurity, and told the owner to strike the yellow flag in her shrouds at his peril.

Finding that he could not succeed in this way, the owner gave up all thoughts of freighting the ship *at New-York*. He then asked the health-officer whether, by the laws of the State or nation, he might send his ship in her present condition *to sea*. Being answered that there was no legal impediment to that, and that he might send her to Tartarus if he pleased, a new voyage was agreed upon, a clearance obtained from the Custom-House, and orders given to the master to carry her to Baltimore to receive a cargo!

This is an example of the manner in which pestilence, engendered on ship-board, is carried from one port to another. And while the contagionists of New-York are railing at the people of Londonderry, and the citizens of Baltimore reviling

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the New-Yorkers, they forget that neither of their cities is to blame, but the true cause of grievance and mischief is in the nasty ship.

INTERESTING PARTICULARS CONCERNING THE CHANGES WHICH THE HUMAN BODY UNDERGOES IN THE GRAVE.

In the neighbourhood of the city of New-York, a little to the eastward, and on the Long-Island side of the river, is a cove called the Wallabough. In this recess were stationed the prison-ships on board of which the American seamen and other captives were confined, during the revolutionary war, by the British. A large proportion of the most vigorous young men belonging to Newport, Nantucket, and other ports in the Eastern States, were taken on the high seas, when engaged in lawful navigation and commerce, and brought into New-York, then the general rendezvous of the British fleets and armies. Regular and prompt exchanges of prisoners not being practicable, these unhappy Americans were confined in the hulks provided for their reception near the shore of Long-Island. Here they endured hunger, thirst, personal abuse, and severity from their keepers, to a degree rarely equalled in the history of modern cruelty. To starving, and denial of almost every necessary of life, were soon added the ravages of pestilence, engendered from uncleanness on board. And, by the operation of these causes in conjunction, were fifteen thousand of the most active and industrious citizens of the United States destroyed between the years 1776 and 1783.

The bodies of these revolutionary victims were buried on the adjacent shore. The spot in which they were interred was then private property. It has since been purchased for the use of the government, and converted into a navy-yard. In digging down the banks to fill up the water below, and form wharves and building scites for ships, this great burial ground has been broken up.

The soil is a sharp silicious grit, containing but a small commixture of clay. It is stratified, and bears evident marks of having been formerly disposed by water; and marine shells are found among it. The strata are not exactly horizontal, but dip a little, and are interspersed with water-worn stones of various sizes, lessening from that of an hen's egg. From the shore the land rises, with a steep ascent, to a height of about 35 or 40 feet. At the bottom of this bank, along its slope, and in the level of an orchard above, the persons charged with the burial of the dead deposited the remains of these

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miserable American captives. They began at the shore, as nearest and least troublesome; and, as they filled the ground with carcases, proceeded further and further inland. The bodies were generally interred one by one, and without coffins.

Reckoning from 1780 to the present period, is twenty-two years. During that time the fleshy parts were all decayed, and somewhat of a soft and dark-coloured mould remains around the skeletons. Of the bones, the skulls, back-bones, hip-bones, shoulder-blades, arms, legs and thighs, are variously decayed, though in some they remain tolerably entire. And it is remarkable that those which were buried near the *salt* water were less decayed than those in the sandy soil above. On examining the skulls, when on a visit to the navy-yard, Dr. Mitchill was inclined to believe, from the openness of the sutures, and the smoothness of the bones, that the greater part of them were *young* men. By the care of Mr. John Jackson, these afflicting remains are collected into boxes, and re-interred in a place where they are not likely to be disturbed again. With a spirit which does honour to his manly and patriotic feelings, this gentleman intends to set on foot a subscription for erecting a monument over them, with a suitable inscription, to commemorate their hard and untimely fate.

DR. LIONEL CHALMERS ON THE ACIDITY PREVALENT IN THE ATMOSPHERE OF SOUTH-CAROLINA.

This philosophical physician published "An Account of the Weather and Diseases of South-Carolina," in two volumes, at London, during the year 1776. Prefixed to this work is *a sketch of the climate, water and soil,* of the region which he describes. In this he notices the flatness of the country near the Atlantic, and the depth of rich mould formed from decayed *animal and vegetable substances,* reaching in some places twenty feet deep; how this is frequently overflowed for rice-fields; and what numberless shoals and swarms of *insects* and *craw-fishes* afterwards die, and mingle their remains with the soil. (p. 2, 3). He mentions the nauseous vapours arising from these things, and from the marshes and corrupting *shell-fish* which have been accumulating for ages. (p. 5). Notice is taken of the putrid exhalations of the multitudes of *fishes* and *reptiles* that taint the air after the expenditure of the water in the indigo reservoirs. (p. 6). *Reptiles, insects,* and their *ova* or *spawn,* are mentioned as abounding in multitudes. "From the surfaces, therefore," he writes, "of so many large rivers, and numerous collections of standing wa-

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ters—such quantities of sunk, fenny and marshy lands—it may readily be inferred that excessive exhalations must be made in this sultry climate:" whence rains, fogs and dews are copious. (p. 8).

These exhalations do not consist of simply aqueous particles; they partake of the qualities of the substances emitted from the subjacent and surrounding bodies. One of the most predominant of these is an ACID, or some other *saline* principle. The proofs of which acidity in the atmosphere are, the speedy rusting of polished metals, and *the remarkable fading of such dyed stuffs* as require acids to fix or heighten their colours. "For these strongly attracting this salt from the air, &c." (p. 11), Chalmers has an instructive chapter (vol. i. p. 87) on the acidity present in the essera or rash, connected with the paroxysms of intermittent fevers; and of the good done by giving magnesia, crab's-eyes and alkalies to cure it.

GALVANISM IN THE CURE OF DISEASES.

It is matter of pleasure and congratulation to the friends of science and of the healing art, that the numerous experiments on Galvanism are likely to terminate in something useful. Deafness, in particular, has been not only relieved, but cured by it. Most of the experiments that we have hitherto heard of, have been made in Germany. In Hamburgh, two gentlemen of distinction have been so far relieved of hardness of hearing, that both are resolved to give the remedy a fair and ample trial. The pile or battery, in one of these instances, consisted of from 25 to 30 plates, made of zinc and type-founder's metal. In the other, after blisters had been applied to the skin over the mastoid processes, a plate of zinc was applied to the blistered part behind one ear, and a copper-plate behind the other, and the connection made by a wire. At Eutin, in Holstein, some have been cured of hardness of hearing, and some of total deafness. At Yever, near Oldenburgh, it is said that thirteen have been cured, most of whom were dumb as well as deaf. Other similar cures have been performed at Ratisbon and Brunswick. It is related that the columns, piles or batteries were, in some of the instances, so powerful in their action as to make the patients faint away, or to benumb and stun them for a while.

In addition to these remarkable facts, it is alledged that these strong Galvanic plates have cured blindness, lameness, and various kinds of atony and muscular weakness.

Besides this information, we have just received a book of

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256 pages, published last year at Berlin, containing a collection of Galvanic experiments, and their application to medical purposes. The title of the work is, *Versuche den Galvanismus zur Heilung einiger Krankheiten, Anzuwenden; angestellt und beschreiben van* C. J. C. Grapengiesser, *der Arzneikunde und Wunderzneikunst Doctor:* i. e. *Experiments on the Application of Galvanism to the Cure of certain Diseases; devised and described by* C. J. C. Grapengiesser, *Doctor of Medicine and Surgery.* He treats of its utility in the following diseases, to wit: 1. Lameness of the extremities. 2. Dimness of sight and gutta serena. 3. Hardness of hearing and deafness. 4. Relaxation of the sphincters of the intestinum rectum and bladder. 5. Apparent death. 6. Hoarseness and loss of voice. 7. Some kinds and degrees of chronic rheumatism. 8. The sciatica, or hip-gout. With directions for applying it in all these cases.—At the end of the book are plates, representing the mode of applying the Galvanic influence to the ears and head, in cases of deafness, by a well-contrived apparatus; and the mode of applying it to parts that have been blistered by cantharides.

From Dr. Albers, of Bremen, Dr. Miller has lately received an interesting work on Galvanism, entitled, "*Commentatio de Usu Galvanismi in Arte Medica, speciatim vero in Morbis Nervorum Paralyticis,*" by Dr. Bischoff; published at Jena in the last year. This work exhibits a history of the discovery and progress of Galvanism; a description of the pile of Volta, with an account of the construction and use of it; and a narrative of some experiments, and of the effects of Galvanism in paralytic and other diseases. Two cases of the efficacy of this remedy in amaurosis are related by this author; in some cases of palsy it was also completely successful. In two cases of epilepsy the force and frequency of the paroxysms were much mitigated; and in deafness great advantages have arisen from the application of it.

Dr. Bischoff has invented a mode of combining the powers of two of Volta's piles, for medical purposes, so as greatly to increase the force of the remedy. A plate, exhibiting the manner of using the two piles together, is annexed to the pamphlet.

ANALYSIS OF AN ARTHRITIC CONCRETION.

M. Carendeffez writes to the editors thus, June 30th, 1801. "Professor Mitchill having requested me to examine a piece of a gouty chalk-stone which was obtained by himself from a man who had suffered many years severe pains of gout, and

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which weighed thirteen grains, I proceeded in the following manner:

"Having reduced the concretion to a gross powder, I poured on it a very limpid solution of caustic pot-ash. A decomposition of the concretion took place, and the liquor appeared of a milky whiteness. After leaving them in mixture long enough to complete their action upon each other, a whitish powder fell to the bottom, and the liquid above became clear. On examining the sediment closely, it was found to contain small films or membranes, and a proportion of gelatin. The gelatin, by mixture with sulphuric acid, became yellow and glutinous. The clear liquid was then poured off, and the precipitate washed carefully with water. The whole was next filtered. On evaporating the filtered fluid, I found it to contain the *urate of pot-ash*, having crystals of a double base, agglutinated, and terminating in two long and obtuse points.

"On tasting this new compound, I found it to possess an urinous, putrid and animal flavour, biting the tongue like pepper.

"To be certain that the fluid now was neither acid nor alkaline, I dipped litmus-paper into it, which gave no sign either of acidity or of alkalinity; so that the liquor was perfectly neutral.

"To the earthy residuum left on the filter I added a little sulphuric acid. A slight effervescence took place. I then poured on some water, and, on adding lime-water to this, the liquor became turbid, and a *phosphate of lime* was formed.

"I hence conclude that this arthritic concretion is a chemical compound of the *phosphoric acid and lime, connected with the uric acid in a free state*, and with a gelatinous substance which pot-ash attacks and easily dissolves." But on this curious subject further experiments ought to be made; and, by persevering in such trials, an obscure part of pathology will probably, at length, be rendered clear and plain.

A SAVING OF FUEL AND TIME IN CALCINING LIME-STONE.

Peter Lossing, of Beekman-Town, in Dutchess County, has obtained a patent (dated August, 1800) for an improved method of converting lime-stone to quick-lime. The principal advantages of his method are these: 1. The fire-place which receives the fuel, instead of being left open, as in the common kilns, is closed after the wood is put in. 2. The heat is

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thus prevented from escaping through the aperture to incommode the workmen. 3. By preventing its dissipation in this manner, the heat is made to ascend through the crude lime-stone piled in the kiln, and to expend its force wholly upon the material to be calcined. 4. A saving is made of a considerable proportion of the wood usually employed in calcining lime-stone; amounting to one half of the quantity commonly consumed by the old lime-burners in the State of New-York. 5. The air, instead of being admitted through an opening in front of the kiln, as in the old mode, is made to ascend through an opening in the ash-hole, formed in an angular direction, coming in at the mouth, and thence through gratings to the fuel above. 6. The quick-lime, so prepared by a rapid and intense heat, is better adapted for building, and preferable for the use of bricklayers and masons. 7. A kiln, containing 1500 bushels of slaked lime, may be completely burned in 48 hours; whereas, in the old mode, at least double that time is required. 8. In this process so little coal or ashes fall into the pit through the grating, that, in the consumption of ten cords of wood, not more than four or five bushels of ashes are formed; the rest of the residuary mass of the wood, in this intense heat, being dissipated, decomposed, and carried off in vapour. 9. A common kiln may be fitted to work upon this plan for the expense of a dollar, exclusive of the doors, and with not more than three hours labour.

Persons who wish to adopt the above mode of calcining lime-stone, are requested to obtain particular directions from the patentee; for, a want of a strict adherence to the principles on which it is designed to operate may bring this useful discovery into disrepute.

Mr. Lossing has improved the art of burning lime in many respects; and his observations tend to show that quick-lime is something very different from mere calcareous earth deprived of its carbonic acid and water. From the quantity of alkaline salt collected at the top of his kiln after cooling, there is reason to believe the convertibility of lime into pot-ash.

ANIMAL ORIGIN OF WHAT IS CALLED "NITROUS" ACID.

A sensible English traveller (Townsend's Journey in Spain, vol. iii. p. 91) has given an account of the salt-petre works in Grenada, and agrees with the idea of the formation of nitrous acid by the combination of the base furnished by animal putrefaction with the vital air afforded by vegetables; obser-

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ing, at the same time, that *animal substances, simply by putrefaction*, afford *nitrous air* also.

Salt-petre, says Gellert (Metallurgic Chemistry, p. 69), as far as may be judged hitherto from experience, is generated *only on the surface of the earth*, where putrefying substances abound; and if any be found in some springs and waters, it is probably owing to its having been only washed out of soils containing salt-petre, and carried downward by rains. Most earths, especially the loamy and calcareous species, are very proper for the generation of nitre, &c.

A ROYAL REMEDY FOR FEVERS.

In 1785 a mortal fever raged at Carthagena, in Spain, and the government extended its care so far as to order a particular prescription *(a composition of sal absynth. sal ammoniac. tart. emet. et cort. Peruv.)*, and no other, to be employed by the physicians. The physicians remonstrated against it; the court threatened imprisonment if they deviated, and the people continued to die. At length the physicians were allowed to prescribe as they pleased in their private practice, but were compelled to employ the court prescription in all the royal hospitals. (Townsend, vol. iii. p. 141.)

DIFFICULTIES IN DETERMINING WHAT IS "THE PLAGUE."

The plague at present signifies any mortal sickness, making, now and then, great destruction of the human species in Asia, whence the Europeans have persuaded themselves they always imported it. How far the opinion of its being caused by a *specific* or *peculiar* contagion deserves countenance, may be judged of from Mr. De Croessantes's account of the visitation of Marseilles in 1720 (Gentleman's Magazine, vol. xxiv. p. 32), where the men who died between Sidon and Leghorn, on board the vessel which brought it, were reported by the physicians as having died only of *malignant fevers*; and, after its introduction into the place, the physicians and surgeons appointed to examine the sick, concurred in a report that it was *not a plague*, but some said it was a *malignant* fever, some that it was a *contagious* fever, and others that it was a *pestilential* fever. Where is the difference? Probably *yellow* fever would have answered just as well.

REMARKABLE FACTS CONCERNING PESTILENTIAL DISTEMPERS.

"The institution of great cities," says Gibbon (Decline and Fall of the Roman Empire, vol. vii. p. 398), "which

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include a nation within the limits of a wall, almost realizes the wish of Caligula, that the Roman people had but one neck." How far the plague which raged in the reign of Justinian, and began in the 542d year of the Christian Æra, was owing to vapours emitted from the earthquakes which overwhelmed the cities of Berytus and Antioch, convulsed all the Roman Empire, and agitated the surface of the whole earth, is an undecided question. It is certain that such a wide-spreading pestilence, invading so large a part of Africa, Asia and Europe, and raging for fifty-two years, must have arisen from some uncommon cause. The pestilential influence of the southern climates upon the barbarians of the north may be judged of by the entire armies of them which were swept off by sickness in the expeditions to Italy. They had a superstitious desire of having their bones interred in their own country. They contemplated the probability of death; and the survivors were charged with the task of boiling out the bones of the princes and nobles, and carrying them back. A cauldron for that purpose was a necessary piece of travelling furniture; and a German, who was using it for his brother, promised it to a friend after it should be employed for himself. (Gibbon, vol. ix. p. 177).

SEPTIC OR PESTILENTIAL GAS NOT ALWAYS DECOMPOSED BY COLD.

It has been confidently asserted by some, that coldness of atmosphere would stop the operation of febrile poison, and that as soon as the ice was formed by the natural abatement of heat in autumn, the ingredients of this compound would be disjoined. This should be understood with some limitation. Fluidity, or a tendency thereto, is necessary to the chemical operation of bodies, and putrefaction cannot go on without it. The formation of ice, then, by retarding or stopping putrefaction and the action of the intestine particles of matter upon each other, will most certainly prevent the further production and extrication of gas in the open atmosphere. But will it decompound the poison formed in houses or ships? It would be happy for mankind if this was the fact. It appears, however, the truth is otherwise. Lind declares, that on the 12th of December, although the weather was *extremely cold, with an intense hard frost, which had continued many days, the* nasty and infected ships in Portsmouth harbour continued daily to send patients into Haslar-Hospital, ill of yellow and spotted fevers, some of whom were besprinkled with numerous petechiæ. The arrival of the Diana frigate, near Christmas,

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from North-America, at Portsmouth, in a sickly condition, looks as if septic poison, produced from nastiness in a ship's hold, was not so easily subdued by cold. Malignant fevers were, in this case, generated among a crew, within a few weeks before the vessel reached the coast of England, during a voyage in winter from North-America to Great-Britian!—The same thing happened to the St. George, another ship which sailed from Spithead in February, 1760, with a healthy crew, and returned, after meeting with bad weather, in an unhealthy plight. In this, as well as in the former instance, the distemper, so far from being stopped, did break out and make its first appearance during an intense cold season, and was of a malignant nature. (Lind on Seamen, p. 209). He observes that the *severest frost* did not mitigate the force of the poison in the ship Neptune (p. 226), and for a very good reason; the frost did not reach and refrigerate the whole inside of the ship.—We are apt to turn our eyes southward whenever infection is talked of. Hot climates are not the only agents in producing infection. The same author relates (p. 188), that after the declaration of war by Great-Britain against France, in 1756, the *greatest number* of patients in the Marine Infirmary near Portsmouth, and those who were afflicted with fevers of *the worst kind*, came from *North-America*, particularly from Quebec, and from St. John's in Newfoundland. And in 1757, the plague which raged in Brest in France, *all winter*, from November to April, 1758, and destroyed more than ten thousand lives, among whom were five physicians, one hundred and fifty surgeons, and two hundred almoners and nurses, was engendered in the fleet, commanded by M. De la Mothe, that returned from the relief of Louisbourg. The plain reason was, these vessels were the most crowded, nasty, and, therefore, pestilential. Our distinction between typhous and yellow fever (see our vol. v. p. 202 & seq.) will explain these facts.

Air-Pump-Ventilator, for the ventilating of Ships, Mines, Prisons, Hospitals, &c. invented by Richard Robotham, of the City of Hudson (N. Y.)

The following are the words of the patentee:—It is a single bellows, fitted upon the top of a tube of wood, or a trunk made of plank, which, in a ship, stands in the lowest part of the hold, by the kelson, and runs up through the lower deck. The bellows is fixed on the top of this trunk, with a valve in the usual place, at the inlet. The outlet of the bellows is made of wood, with a square angle, which turns upwards,

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and a valve in the upright part, that shuts down, in such manner that the bellows fills from the bottom and discharges at the top. If the bellows discharges one barrel at a time, the insides of the trunks must be six inches square; it will be then sufficient for a vessel of three hundred tons; but if they are four or five times this size, the machine may be worked by the labour of one man: or, about one square inch of enlargement may be made in the trunks to each gallon in the bellows: then it will fill and discharge about twenty times in a minute. The bellows may be made in various shapes and sizes at pleasure. This improvement consists altogether in filling the bellows at, or from the bottom, and discharging the contents at the top, above the upper deck, or out of a port-hole.

INFLUENZA.

An epidemic catarrh has been prevailing more or less in most, and, probably, if accurate information could be obtained, in all parts of the United States, at some period between the latter part of last June and the middle of August. This disease, in general, has appeared under a mild form. Besides the usual catarrhal symptoms, it often attacked the throat, ears, jaws, teeth, and all the neighbouring parts, producing pains, swellings, and frequently abscesses of a troublesome and obstinate kind. Many were affected with pains in the breast, sides, back, and limbs; but the febrile symptoms were commonly moderate. In the city of New-York this epidemic was discovered in the last days of June and the beginning of July, and continued to prevail more or less till the middle of August. We have received notices of it from different parts of the Eastern States, from high northern situations, from the city of Philadelphia, and as far to the southward as South-Carolina. In the minds of many persons, this epidemic excited, and not without reason, apprehensions of the prevalence of malignant diseases in the latter part of the summer and through the autumn.

YELLOW FEVER.

The return of this malignant disease has renewed the alarm which unhappily has too often occurred at this season, in several cities of the United States. Philadelphia was the first to experience the visitation of this pestilence. Soon afterwards it appeared at Baltimore; and, still later, at Portsmouth in New-Hampshire. In some parts of the interior country, especially in the neighbourhood of morasses, swamps, and other low ground, we have also heard of its appearance and fatal effects.

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In all the instances just mentioned, this disease, compared with many former seasons, has spread but little, and produced only a small amount of mortality. In Philadelphia, we learn that some cases of extreme malignancy, equal to the worst of former seasons, have been observed; yet it is remarkable that these few cases have been scattered throughout almost all parts of the city, without exhibiting the contagion so much dreaded, and upon which the propagation of the disease has been supposed, by many, solely to depend. From Baltimore we also learn that malignant cases have occurred in all parts of the city, though few in number collectively taken; and that the contagious dependence of these cases upon one another has not been found possible to be discovered by the most assiduous observers.

A more particular account of this disease in the above mentioned cities may be expected in our next number.

DR. ALBERS'S AMERICAN ANNALS.

The learned Dr. Albers, of Bremen, has lately transmitted to Dr. Miller the first volume of a periodical work, published by himself, entitled, "*Americanische Annalen der Arzneykunste, Naturgeschichte, Chemie und Physik*,"—"American Annals of Medicine, Natural History, Chemistry and Physics." In this work a minute and satisfactory account is given of the progress and present state of science in the United States. American publications are examined in a candid and liberal manner, and the literary and scientific exertions of our countrymen are exhibited in a respectable light. Besides his attention to other publications, the author presents an analysis of all the more important papers contained in the "Transactions of the American Philosophical Society," and the "Medical Repository."

COXE'S OBSERVATIONS ON VACCINATION.

Dr. John Redman Coxe has lately published, "Practical Observations on Vaccination, or Inoculation for the Cow-Pock." This work is embellished with a coloured engraving, representing a comparative view of the various stages of the vaccine and small-pox.

On the 1st of May, 1801, Dr. James Mease, of Philadelphia, was elected a corresponding member of the "Literary and Philosophical Society of Manchester."

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FOREIGN.

TREATMENT OF RANULA, ITCH, &c.

IT is well known, that in cases of ranula simple incision frequently effects a cure. In some instances, however, and particularly where the cyst is thick, this method is insufficient.

A case of this kind occurred a few months ago, in which a surgeon had five times operated in this manner, but without success. When the child was brought to me, the tumour was so large that it compressed the tongue with great force against the roof of the mouth, so as totally to impede sucking, and even deglutition. In this extremity the excision of a portion of the cyst afforded present relief, and produced a perfect cure.

The next subject on which I shall offer a few remarks is the treatment of the itch; a disease which is sufficiently afflicting and disgusting, without the aid of that infernal drug, brimstone.

Having been frequently disappointed in my attempts to cure it with ointment of white precipitate, and solutions of sublimate, and having observed that the latter caused considerable inflammation of the skin, without proving a certain remedy for the distemper, I combined the two with an unctuous substance; and, from that time (above five-and-twenty years), have never known it fail in a single instance. The form is as follows:

℞ Hydrarg. muriat. gr. x. Calcis hydrarg. alb. ʒj. Adipis suill. ℥ iij. Essent. bergamot. ʒj. M. ft. unguentum.

With this ointment the patients are to rub themselves all over every night. The quantity here prescribed must not be used in less than ten nights, even in an adult. Care must be taken not to rub too much on any particular part, especially on the bend of the elbow; otherwise, inflammation and excoriation may be the consequence.

The absurd custom of giving sulphur, or any other medicine, internally, for this cutaneous disorder, ought to be discontinued. I have often known dysenteries occasioned by such practices; and the pretended remedy prove worse than the disease.

The preparation of mercury here proposed seldom affects the salivary glands. Its greatest inconvenience is a troublesome heat, rash, or other effects of too powerful a stimulus applied to the skin; which, if the patient be properly cautioned, may be instantly relieved by substituting a little

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plain lard instead of the ointment. This application ought to be continued till the troublesome symptoms are perfectly removed.

A preparation of the same kind, but only of half the strength of that already prescribed, is one of the most efficacious remedies for the tinea capitis; in the cure of which constant care must be taken to keep the surrounding hair as short as possible. By means of this ointment, applied once a day, I have succeeded in the cure of every case in which it has been tried, amounting to many hundreds. One of the patients had laboured under the disease fourteen years; and his father wisely determined to get him cured, if possible, before he put him out as an apprentice.

Many others have been cured by the same remedy, who had been given up as incurable. No internal medicine whatever was exhibited in any of these cases; a sufficient proof that no internal medicine is necessary in such cases, whatever may be the prejudice, or whatever may be the interest of medical men.

The same topical application proves equally efficacious in the case of tetters, and various other affections of the skin.

[*Med. and Phys. Journal.*

USE OF BLISTERS IN DELIRIUM.

The great use of blisters applied on the shaved head in some cases of delirium, is sufficiently known to practitioners; but a remarkable instance of that kind is recorded in Hufeland's useful Journal for Practical Medicine, vol. xi. No. 4. The patient perfectly recovered his senses the next morning, after a blister had been put on the shaved head the night before. The excoriated places were kept open with unguent. basilic: and pulvis cantharid. for ten days; and when the patient seemed perfectly reasonable, the wound was dressed with ceratum saturni, in order to heal it up, which, however, having hardly been effected, the patient was again seized with delirious fits, which increased to such a degree, that recourse was had to another blister, which being kept in suppuration for three weeks, the patient was entirely restored to health. Besides the blisters, proper internal remedies had been employed. The editor of the above Journal relates, in addition to this, a case of apoplexy, in which the application of an actual cautery proved most efficacious. "A lady having been taken with an apoplectic fit, lay in a soporous state, against which all possible remedies had been employed in vain by

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the attending physician, when a friend of the patient recommended to apply paper burnt to tinder on the shaved head. This had hardly been done, when the patient arose with vehemence, tore off the cap that had caught fire, and cried with a strong voice, 'Will you burn me!' Against the first intention, the cap had been set on fire by some glowing points in the tinder that were overlooked; and though the skin on the head of the patient was considerably burnt, the patient had the advantage of being perfectly recovered. [*Ibid.*

OBITUARY.

The British prints announce the death of ERASMUS DARWIN, M.D. F.R.S. &c. Author of the Botanic Garden, Zoonomia, Phytologia, &c. &c. on the 18th of April last. Some account of this illustrious physician, poet, philosopher, and ornament of the age, may be expected in a future number of this work.

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APPENDIX.

ARTICLE I.

On Dyspepsia.

To the Editors of the Medical and Physical Journal.

Gentlemen,

The experienced medical practitioner will admit, that a large majority of chronic diseases, and not a small proportion of those of an acute description, owe their origin to indigestion; nor will it be denied by the most intelligent of the profession, that the difficulties in the way of restoring the stomach to a due performance of its digestive function, are such as often to baffle the most approved modes of treatment. It frequently occurs that the ordinary tribe of stomachic and tonic medicines, usually prescribed in dyspeptic affections, affords, at best, but temporary relief; and that, sometimes, by their undue stimulant influence on the stomach, they indirectly induce an additional degree of debility on that organ, with the accustomed train of hurtful consequences, such as nausea, anorexia, and systematic atony. It has repeatedly happened to me to observe an irretrievable progress in dyspeptic affections during the protracted and inefficient employ of stomachic medicines; and on these occasions the failure of benefit has apparently arisen more from an implicit reliance on the *sole* efficacy of these agents, than on the irremediable nature of the affection.

An inveterate distrust in any thing like uniform medicinal efficiency in the infinitely diversified nature of organic susceptibility, first induced me to try, in obstinate cases of indigestion, the effect of a rigorous attention to a certain plan of domestic management, in conjunction with the usual treatment. The advantages resulting from this procedure have enabled me duly to appreciate the importance of the co-operation, and have farther warranted me in expecting that its *solitary* adoption would in general render the conjoint employ of medicine unnecessary in the cure of dyspeptic disorders.

The treatment alluded to consists in cautiously avoiding mechanical impediments to the process of digestion, and in

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counteracting that stomachic languor and irritation which prevent the salutary secretion of gastric juice; an agent so indispensably necessary to the due decomposition and assimilation of alimentary substances.

Extensive experience has now fully confirmed the important fact, that the worst states of dyspepsia, arising from default in stomachic excitability, and gastric secretion, unaccompanied with organic læsion, may be effectually remedied by an appropriate regard to the quantity of diet taken at a time, to suitable mastication, friction over the region of the stomach, and the avoidance of costiveness. The mode of practically applying the conjoint influence of these several aids, consists in limiting the quantity of aliment taken at one time to two ounces; in confining it chiefly to animal food, particularly mutton and pork; in masticating it so long that it may be reduced, by comminution and salival commixture, to a semi-fluid state. This may be repeated once in three hours. No diluent fluids should be taken with the food, nor until one hour after each repast, lest the solvent property of the mixed saliva should be thereby diminished; nor should the quantity of fluid taken at once ever exceed half a pint, nor be repeated oftener than at intervals of three hours.

About half an hour before swallowing the portion of aliment proposed, brisk friction should be performed with a flesh brush over the region of the stomach during at least ten minutes; a similar operation should also follow it. If the irritability of the skin over the stomach should dispose it to inflame, or throw out eruptions by repeated rubbing (which sometimes happens), the surface may be smeared with olive oil previously to performing it: on the contrary, should neither a glowing sense of warmth on the surface, nor any other sensible impression be made by the friction, either powdered mustard-seed, pepper, ginger, or spirit of wine, may be sprinkled over the skin before the application of the flesh-brush.

Flatulent distension, and the aching uneasiness of the stomach connected with it, are speedily subdued by the stimulant effect of the friction; and if the precaution be observed of rubbing circularly from right to left, the redundant gaseous substances extricated, and accumulated in the stomach during indigestion, will be extruded at the pylorus, or lower orifice of the stomach, and transmitted through the intestinal canal; while in the contrary, or a more promiscuous direction, they may escape by the cardia, or upper orifice, and be forced up the œsophagus in sonorous, painful, and unpalatable eructa-

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tions. An habitual attention to the removal of costiveness will powerfully aid the beneficial effects of this treatment. No remedy will be found so effectual in subduing this insidious and destructive enemy to health in general, and to digestion in particular, as instituting a regular custom of periodically soliciting an evacuation by voluntary and persevering effort. The morning is the proper season for the attempt; it should on no occasion be omitted, and the trial should be prosecuted during at least fifteen minutes, if the peristaltic power be not earlier excited to adequate motion. A week has been unavailingly employed in this endeavour, but the proposed effect has been attained within a fortnight; and one month has in numerous instances fully established an *habitual* call to intestinal evacuation, under circumstances that previously required the almost daily use of aperient medicines.

Were it necessary to illustrate the conjoint efficacy of this treatment by particular cases, it would be in my power to go into a much more extensive detail than you may think necessary to admit in your publication. It may, however, be proper to remark, that a vast variety of dyspeptic affections, thus managed, have been recorded by me, many of which had been the cause, while others had been the effect of chronic maladies, and the whole of them had been more or less unsuccessfully combated with the usual medicinal means of relief. Cases of a description so deplorably forlorn have been remedied by this management, that it would be much more satisfactory to me to have a similar effect repeated in the experience of others, than by stating them to risk incurring any doubt of the credibility of the relation. Nor has the success alluded to been partial or selected; a degree of uniformity has indeed marked the salutary influence of the practice but rarely found in the medicinal treatment of disease.

In some cases, the cure has been both perfect and permanent; in others, unexpected relief has been afforded; and in all, sufficient benefit has been rendered to encourage an unwearied prosecution of the means.

In reflecting on the mode of remedy here proposed for dyspeptic affections, it may be allowable to observe, that the fashionable employ of medicine on all occasions of disease, has often led to an unguarded neglect of co-operative aid from domestic and self-management; as if the powers of life, and the peculiar conditions of health, were not more under the dominion of *ordinary* than *extraordinary* agents; as if the stomach, for example, were not more likely to return to its regular di-

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gestive function, when solicited by the congenial influence of an approach to its natural state, than when disturbed, tortured, and all but disorganized, by the almost intolerable stimulant impressions of *reputed* stomachic medicines; and these too employed (as if the curative intention were to be accomplished by an absolute *fiat*) under a lax regard, or even total indifference to collateral assistance.

The healing art consists in instituting the most appropriate modes of curing diseases, not in uniformaly wielding against them medicinal substances.

If health can be regenerated by regulations calculated to reproduce its indispensable conditions, the salutary end of medicine is happily attained, without the loathsome necessity of resorting to the employ of noisome drugs.

Without wishing unduly to curtail the multifarious extent of the materia medica, humanity, it may be allowed, must triumph in every fair opportunity of substituting domestic for medicinal remedies.

While the dyspeptic patient will be satisfied with deriving the desired benefit from the treatment here recommended, the philosophic medical practitioner will readily explain the way in which salutary consequences are likely to result from its employ. The function of digestion is perhaps more scientifically understood than any other in the animal economy. The importance of the gastric secretion is admitted, and a due supply of saliva is also known to be essentially requisite in facilitating the changes that are to be effected on alimentary substances in the stomach.

The supply of the gastric juice and saliva, in due quantity and quality, will depend on the healthy excitability of the stomach and salival glands; thus, in impaired digestion, the attention should be chiefly directed to adjusting these necessary conditions.

In directing a limited quantity of food oppression is obviated, the motive powers of the stomach are adequately excited and unclogged, while the elaborate mastication recommended, and the consequently copious commixture of saliva, leave less to be accomplished by the decomposing influence of the gastric juice.

Friction on the abdomen excites motion, which, by associated efficiency, is propagated to the stomach, and serves to impart additional activity to the digestive process.

Neither similarity of structure, nor direct continuity of connection, subsists between the cuticular surface over the region

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of the stomach, and the substance of that viscus; yet an intimate consent of motive power obtains between these several parts, which explains how topical friction extends to the salutary influence of the organ itself.

It is a succedaneum for corporeal exercise, and, by being concentrated on the stomach, proves a more direct remedy in the removal of flatulency, and other morbid inconveniences arising from indigestion, than could be afforded by a more general exertion of the system.

The fertile causes of dyspepsia are repletion and inaction. The combined tendency of these evils is to induce both stomachic and systematic oppression. The necessary demand for nutriment is varied by the degree of voluntary exertion, superadded to the involuntary motions of life; if the former be too limited, morbid repletion, both locally and generally, can only be avoided by a moderate use of diet; on the contrary, if the habitual exercise be carried the length of inducing frequent perspiration, and muscular fatigue, the exigencies for alimentary support will be proportionately great; hence an exact ratio subsists between the exhaustion from exercise and the want of nutritive supply. If this balance, so accurately struck by Nature, were uniformly sustained in the conduct of mankind, dyspepsia, and the hydra train of mischief it is liable to produce, would scarcely be known in the catalogue of human afflictions.

The plan of remedying indigestion here recommended on the authority of abundant experience, is further warranted by the analogy it bears to the agency usually obtaining in the process of natural digestion. In the one case, stomachic oppression is obviated by small portions of food taken at a time, by assiduous mastication, salival commixture, and intestinal regularity; while digestion is much promoted by abdominal friction: in the other, or the ordinary performance of this function, personal exercise becomes a substitute for these precautions; it accelerates the animo-chemical combinations and decompositions, which constitute the motive evolutions of life; and thus requires such an extent of nutritive supply from the digestive function of the stomach, as at once obviates morbid plenitude, and induces salutary hunger.

I am, &c.

ROBERT KINGLAKE.

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ARTICLE II.

Pestilential Distempers *at* Manchester *and* Leeds, *in* England.

THE manufacturing towns in England are almost always infected by a pestilential disease, which the inhabitants call low infectious or typhous fever. The vigilance of the boards of health has sufficiently traced their origin to nastiness and filth, derived from human bodies, and accumulated on the persons, in the bedding and habitations of the sick. This accumulation of unclean and pestilential matter is to be ascribed to the poverty, ignorance and carelessness of the victims of this home-bred poison. Through want of alkaline salts to neutralize and absterge their perspired and other excreted fluids, and of air to dilute and waft away the venomous gases engendered by them, the wretched manufacturers fall sick, and often die in great numbers. If the climate of Manchester and Leeds was as hot as that of New-York and Philadelphia, and the people as replete with beef and other animal food, and as much stimulated by distilled spirits, as those of the United States, there can be no reasonable doubt that a true yellow fever would be produced. But in England, the *coolness* of the weather, and the *low diet* of the poor, prevent the formation of so much pestilential air, and the exciting of such high-wrought, acute and malignant symptoms. As a proof of this, the same nastiness which would cause typhus in England, will excite yellow fever if accumulated and transported on ship-board to the coast of Africa or the West-Indies.

There is so much good sense, and so many instructive facts, in the proceedings of the committees for investigating the causes of their endemic distempers, in two of the great manufacturing towns of England, that we conceive we are at once doing service to physic and police in publishing extracts from their addresses to the public. They show that typhous fever, like yellow fever, proceeds from nastiness, and may be prevented by cleanliness and ventilation. See Med. Repos. vol. v. p. 194.

No. I. *Manchester Address.*

"The great increase of low and infectious fevers amongst the poor of this town and neighbourhood, during the last and present year, has induced the board of health to renew its in-

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quiries concerning the best means of guarding against and suspending a calamity so peculiarly afflicting to the labouring classes of the community. From the information given by the physician of the Infirmary, and other persons employed in attending upon the sick, the board of health are enabled to affirm, that with proper caution on the part of the poor, and due attention of their landlords, the origin and progress of fever, and other infectious diseases, might be greatly counteracted, if not entirely subdued. To effect this desirable purpose, the board earnestly solicit the attention of the poor to the following observations and instructions.

"1. *Be careful to avoid living in dark, damp, and confined cellars; or in back streets adjoining to privies, or heaps of offensive and corrupted matter, as this is one of the most common and certain causes of infectious fever.*

"2. As fevers are found to prevail most wherever families have been *crowded together in small rooms*, and especially where there is not a sufficiency of beds and bed-covering, it strongly behoves you to guard against the danger arising from such a mode of living: indeed, did you but consider, that one of the surest means of preventing fever, and hindering its spread, is to provide a proper number of *clean beds for the use of your families*, both in sickness and in health, you would be led to lay out every farthing you can save in the purchase of such valuable comforts.—How often have the feelings of your benefactors been hurt, by seeing, in some habitations, an useless and expensive piece of furniture, such as a gaudy clock, or ornamental chest of drawers, *when the miserable husband, his wife, and numerous family of both sexes, have been compelled to lie crowded together in one bed*, for want of any other accommodation! This is *an increasing and a crying evil*, and, as such, demands the serious attention of every poor person who has any regard for the health and morals of his family.

"3. Strict attention is necessary to keep your houses and persons in *as regular a state of neatness and cleanliness* as your employments will permit. It is a certain truth, that most fevers arise in those parts of the town where the people pay the least regard to *a cleanly and decent mode of living;* and, since the trouble of half an hour each day is sufficient for the purpose of cleansing your habitations and persons, it must either proceed from a shameful degree of idleness, or a *disgraceful satisfaction in dirt and filth*, that a small portion of your time is not thus employed.—It has been observed,

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that want of cleanliness and fresh air gives rise to that worst kind of fever, called jail-fever, which frequently resembles the fevers common among that class of inhabitants who are least attentive to cleanly habits.

"4. Children who work in cotton mills during the night, are more liable to fevers, and other kinds of sickness, than those who are employed only in the day; but if you are under the necessity of exposing your offspring to night labour, take care that they are not deprived of their sufficient quantity of sleep during the day, and do not suffer them to sleep with their clothes on, or to lie down, till the bed from which the family must necessarily just have risen, has been properly prepared to receive them. It is too often the practice of careless mothers to suffer their children, who are night workers, to sleep by the fire-side, or upon the floor; a practice most injurious to their health, and to the welfare of the family.

"5. Let your children be fed and washed before they are sent out to their daily work; and take particular care to wash their feet and legs clean as often as occasion requires; by attention to this simple rule, your beds and apparel will be kept in a more clean and comfortable state, which will serve materially to guard against infection.

"6. Be careful to take your meals at stated times; this not only promotes health, but likewise frugality, and, instead of half starving yourselves and families, by living chiefly upon tea, in which there is little if any nourishment, let a part of your diet consist of rice (a most wholesome and cheap kind of food), and soups prepared from meats and vegetables; this kind of diet will enable you to sustain bodily labour, and in a great measure will preserve you from the attack of disease.

"7. *Fevers have of late been much increased by poor families coming from a distance, destitute of clothes and money. These are thrust into some damp and dismal cellars, where, from want of beds and proper nourishment, the worst kind of fever is produced, and frequently spreads throughout the neighbourhood.*

"The board of health consider it also as a very important part of their duty to offer the following suggestions to the landlords of the poor.

"The prevalence of fever in this town is greatly to be attributed to the improper situation and bad mode of construction of the habitations for the poor. It is a common practice to contrive cellars considerably below the surface of the ground, both to the front and back of each building, where there is

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not a sufficient inlet of light, or air, or drains for the purpose of carrying off the water; in consequence whereof, these abodes are damp, dismal and unhealthy, and afflict their miserable inhabitants with colds, fevers, and other diseases. *In many parts of the town, houses are erected, with their fronts opposite to open privies, and joining to accumulations of every kind of filth, and where the space between the fronts of one range of buildings and the back of the other is so narrow as to prevent the circulation of air, or free admission of light.* To such a degree has inattention of landlords to the welfare of the poor arisen, that, in many new buildings, there is an absolute want of any casements, or other means of letting air into the apartments, than by opening the windows: the consequence of this is, that, *from want of a proper ventilation*, the poor become sick; and, when in this state, are liable to suffer injury from the partial admission of air through the panes of the window, which are necessarily broken for that purpose. The necessity of frequently *white-washing the cellars and houses of their tenants* has often been urged to landlords; but it appears, that almost an *universal neglect* of so cheap and salutary a method of preventing disease prevails throughout the habitations of the poor. If landlords would but consider their true interest, they would be desirous to obviate the above-mentioned evils, as, no doubt, the incapacity of the poor to pay their rents arises *chiefly from their being so frequently subject to diseases.*"

No. II. *Advice at Leeds.*

"The following address to the inhabitants of Leeds has been published by a committee appointed to make inquiry respecting the infectious fever that has for some time raged there. —We most earnestly recommend the subject to the attention of the principal inhabitants of all manufacturing towns.

"It appears, from the collected information of the faculty, that a fever of a very contagious nature exists in different quarters of this town, and that, owing to the *confined and unventilated* apartments of those families where it usually takes place, it has, in many instances, proved fatal.

"This is also painfully confirmed by an examination of the parish register, whereby it appears, that although the autumn of last year nearly doubled in general mortality the present, yet the deaths by fever are increased. The mortality, by fever, for the last month, is one half more than the corresponding month of 1800.

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"As examples of its highly infectious nature in the close and noisome dwelling of the poor, and of the utter impracticability of applying proper remedies, we insert the following facts:—The one is in a family consisting of thirteen individuals, five of whom were infected within the first four days, and four more have been since attacked.

"The other case is still more deplorable:—Two forlorn beds, without linen, and covered only with rags, contained six poor adult persons: the fever attacking one by one, soon spread through the whole, and the dying lay stretched on the same miserable bed: yet such was the fatal perverseness of the relatives who attended them, that although wine and medicines were at their command, they could not be prevailed upon to give either, and for two days received neither food nor medicine: the consequences may be easily supposed; the father and mother of the family both sunk under such accumulated wretchedness.

"Facts such as these clearly show the inefficacy of any measures short of actual and timely removal from the place of infection and nastiness. We forbear to multiply them, unwilling to add to the distressing catalogue. Indeed, we feel persuaded, that having appealed to the humanity and benevolence of our fellow citizens, there need not motives of policy to call forth their exertions.

"In Manchester, by an institution of this kind (*i. e.* a house well alkalized and well ventilated, see Med. Repos. vol. v. p. 191 & seq.), the number of fever patients were reduced, the first year, from 2880 to 1759, and there was a decrease of 400 burials within the same period.

"In one district, immediately in the vicinity of the fever ward, the fevers were reduced from 400, the average number of fevers previous to opening the fever ward, to 26, the first year.

"In Chester, fever wards were established within the Infirmary so early as 1783, and though one ward is situated within 13 yards of the fever patients, with whom it communicates, on the same floor, by a passage and doors frequently open, yet, during the period of eighteen years, it has never been suspected that the patients in other parts of the house have caught any infection from the fever wards, by any contamination of the atmosphere, nor from any transgression of the rules of prevention.

"Some dwelling-houses are placed at but a little distance from the fever wards, and Stanley Place, inhabited by very genteel families, is not far distant from them.

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"The Committee beg leave to call the attention of the inhabitants to these facts, as they prove, that a House of Recovery is by no means detrimental to a neighbourhood in which it is situated.

"In Chester, so salutary have been its effects for eighteen years, that in the spring of 1795, when a very fatal epidemic raged in Manchester, Liverpool, and other neighbouring towns, only two cases of fever occurred in the Chester fever ward, and not one in the rest of the town.

"It would be the height of scepticism to doubt the impression which facts such as these must have on the mind of an enlightened public; and the Committee feel assured, that an institution, pregnant with so much good, will meet with every due encouragement, liberal support, and patronage, from the rich, cheerful and grateful acceptance on the part of the poor."

CORRESPONDENCE.

Rusticus, of Massachusetts, may find some experiments in Mr. Kirwan's Essay on Manures, to prove the existence of carbon in soils. The black mould of rich lands abounds with carbon. The water of puddles, pools, ponds and lakes, contains a great proportion of it. When mingled with them, it gives them a dark colour, and, when suffered to subside, it forms a black stratum at the bottom. Peat, turf, bog, marsh and hassock, as well as dark soil in swamps, meadows and new lands, all contain plenty of carbon. Vegetables, as they grow, consume this; and in cultivated uplands, after a few crops of Indian corn, hemp or wheat, so little of it is left, that *artificial* manuring becomes necessary; and carbon is *one* of the ingredients of such manure, whether it comes from the barn-yard or elsewhere. It has been asked, why a greater depth of carbonic soil is not accumulated in the American forests? Because, we answer, so many living vegetables, and, among others, trees of vast size, are constantly feeding upon it, and converting it into their nourishment, that there is little opportunity for it, in such places, to accumulate on the earth. When embodied in plants and animals, carbon is set loose again by putrefaction and fire.—*Rusticus* will remember that the diamond is pure carbon in a crystallized form.

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MEDICAL REPOSITORY.

VOL. VI.—No. II.

ARTICLE I.

Singular Case of ISCHURIA: *Communicated by Dr.* WILLIAM PARKER, *of Charleston (South-Carolina), to Dr.* MILLER.

ON the 4th of November, 1801, Mr. Abraham Markley, a young gentleman of this city, aged eighteen years, usually in high health, and of a habit promising to be muscular, was affected with suppression of urine, accompanied with pain in the lower part of the abdomen, and this particularly violent on any effort to pass urine. For three weeks preceding, he thought he had voided it with some uneasiness, and in a smaller stream than usual. He could assign no cause for these symptoms, though it was ascertained, in the subsequent course of his disease, that he had, shortly previous to any affection, exerted himself in climbing up a rope, by the action of his hands and legs, the rope passing in a line down his body, and between his thighs; and further, that he had exercised himself in running and jumping over a fence. His pulse and tongue were in a natural state, the belly slow, appetite not yet impaired, and the urine natural in colour and transparency; nor were there any affections in the neighbourhood of the kidneys.

He took, during the first day, some aperient and diuretic medicines, as also some moderate anodyne doses, and went repeatedly into the warm bath. In the evening, the first of these had operated slightly, but without relief to any of the symptoms. The injections which were given to ensure their passage through the bowels were generally received but partially, and with pain, and for the most part instantly and forcibly rejected. He had voided no urine during the day. The pain in the abdomen was increased. Pressure about the region of the pubes more and more intolerable. Much tension ob-

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servable along the course of the linea alba, and a slight tumefaction below the umbilicus, inclining to the left; pulse now full but soft.

He was now blooded, and the catheter introduced. No resistance in the course of the urethra, and perhaps less than natural at the neck of the bladder. Not more than one ounce of urine, of an ordinary appearance, came off; not, however, without sensible relief. He was directed to continue his medicines, and the bath or fomentations as before, unless ease and consequent sleep should render them inexpedient through the night.

5th. The pain recurred soon after leaving him last evening. No discharge of urine during the night. No rest. Eight ounces of urine drawn off by the catheter in the morning, and the same quantity at noon. Not more than two ounces came off in the evening. His medicines and other applications through this day the same as yesterday.

Evening. Every symptom aggravated; venesection proposed, but not submitted to.

6th. About day-light, after a distressing night, he suffered twenty ounces of blood to be taken away. About eight ounces of urine came off spontaneously, which, in this solitary instance, rendered unnecessary the use of the catheter. At the joint request of Dr. Noble and myself Dr. Baron was called to visit him at nine A. M.

Some relaxation of the tension down the linea alba having taken place, a circumscribed tumour could now be clearly felt, reaching above the umbilicus, and extending considerably on each side, but most perceptible on the left. A large blister was applied between the umbilicus and the pubes, and the saline medicines continued through the day.

7th. Has passed some urine in the night, but is now unable to retain it. No other evident relief. Belly bound. Much distressed with pain in the body of the tumour. Took cathartic medicines, which procured some evacuations, and at night the same combined with anodynes.

8th. Costive. Urine evacuated occasionally, though somewhat sparingly. Great distress in the abdomen generally, apparently caused by accumulation of fæces. Injections came away as injected, and were thought to induce a distressing tenesmus from continued repetition. The tumour on the increase.

A cathartic mixture was given at intervals through the forenoon, to no purpose, and in the afternoon strong doses of pills

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of jalap and calomel. Evacuations followed sufficient to ward off present danger, and to justify the exhibition of moderate anodyne doses, so urgently called for by frequent fits of pain, and inability to sleep. The tumour undiminished, though somewhat less painful on pressure.

9th. The bowels, though not obstructed through this day, yet slow. The purgative medicines continued, and at night again indulged with a moderate anodyne.

10th. A bad night. Fœcal evacuations still continue, but have become remarkably fetid and bilious, accompanied with other appearances leading to apprehend typhous debility. Urine passed naturally, though rather scantily. The tumour rather increased. Took this day his purgative medicines in a light decoction of bark.

11th. Costive. Injections distress him more than ever. Tumour enlarged. Took, through the day, six doses of strong cathartic pills, and sixteen ounces of a cathartic mixture.

12th. No evacuations. Stomach retains nothing; fæces appear diffused with what was ejected. Tobacco smoke, by injection, was now tried without obvious or immediate benefit. Enormous fœcal vomitings during the forenoon exhibited this formidable case in its most shocking form. The warm bath was ordered.

At this crisis, when the attending physicians were about retiring for further consultation, the patient requested that Dr. L. S. a French gentleman in much estimation, might be called to his assistance. The subsequent management of the case devolved principally upon him. On this account, and as the disease soon after became a chronic affection, daily notices of it were omitted.

The case being now considered as *hernia ventralis*, a correspondent treatment was adopted and carried to the utmost possible extent. He continued in the warm bath several hours at a time. Evacuations were solicited by injections, with the cassia fistularis dissolved in them, and by purgatives least apt to irritate. They came on, bringing relief from the vomitings as well as from the general pain in the abdomen. This plan was continued for two or three days, not without sanguine hopes of success; yet it was discouraging to perceive the tumour still on the increase. A tympanitic affection, which was before observable, in a slight degree, soon became the most urgent symptom, and diffused itself over the whole abdomen, presenting an uniform enormous swelling, tense, elastic and sounding. The warm bath was then desisted from, and tonic, evacuant

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and carminative medicines again had recourse to, with the effect of removing, in a great measure, the tympanites. Thus the fine constitution of our patient unexpectedly withstood this second shock; though it was only to show us what further variety of suffering an originally good frame, unbroken by intemperance, might endure before it finally yields. On the subsiding of the tympanitic swelling the original tumour came again into view, still larger than before. Several attempts were made to effect a radical cure, according with various views which were at different periods taken of the disease. Among these, after a consultation with Dr. Polony, who first discovered evident fluctuation in the tumour, (by that time grown so large as to come for a considerable extent in contact with the parietes abdominis) tapping was put in practice. On this occasion about half a gallon of *urine* flowed off freely, when, on a sudden, the discharge stopped, and an inexpressible anxiety and pain were diffused over the whole internal abdomen. These, however, gradually lessened during the two or three succeeding days; but at the same time the tumour was reappearing, and on its having gained its first size, his sensations were in their former state. An elegant preparation of the digitalis, prescribed by Dr. Polony, was tried to no purpose; nature began to flag in her resistance to six or eight weeks of unremitted pain, and the want of due action in an important organ; debility and emaciation increased daily; and the treatment was latterly only with a view to palliation.

He was now attacked with a distinct series of inflammatory symptoms, acute pain in the right lumbar region, inability to lie on that side, feverishness, &c. which continued, without being materially relieved, through the remainder of his illness. While these were yet progressing, he perceived, as he thought, something to burst within him, on the left of the tumour, giving him sensible relief; after which, a circumscribed part near the spot was very discernible to be much softer than elsewhere. The last affection, in this case, was an inability to move the limbs of the right side, which had continued two days, when death put a period to his miseries.

DISSECTION.

On laying open the abdomen, the bladder presented itself greatly distended, and reaching half way up between the umbilicus and the scrobiculus cordis. Below the umbilicus a strong adhesion existed between it and the peritonæum, by a circular space of about three inches in diameter. In this, how-

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ever, no inflammatory discolouration remained. Through this adhesion the trocar had passed; of course he was not disturbed by urine in the abdomen. On the left of the bladder, immediately corresponding with the soft spot discovered on the abdomen before death, a protuberance appeared, which being opened, was found to contain about one ounce of urine, in a chamber, formed between the outer and middle coats of the viscus, and communicating with the main cavity by an orifice capable of admitting a small quill. In the latter were found upwards of three quarts of urine, of a common appearance. After it was completely emptied, and wiped with the sponge, it was soon found to be filling afresh, and this repeatedly; the supply coming from the orifice of the right ureter. While dissecting, with a view to the examination of the kidney, the knife passed suddenly into a large sac, lying adjacent to that viscus, on the right side, containing upwards of a quart of urine. Considerable marks of inflammation appeared in the neighbouring parts, and some pus was lodged at the bottom of the cavity. The kidney itself was paler than usual, and more flaccid; its pelvis (then collapsed) not evidently enlarged, but having a communication between its cavity and that of the sac. The bladder was thickened, and of harder texture than common, though it could not be decidedly pronounced to be in a schirrous state; if by this term, so often applied to diseased bladders, be meant an affection of the same nature with schirrous glands.

From these appearances after death, and from the order of the symptoms previous to it, it cannot be doubted that the cyst near the kidney must have been formed by a rupture of the inner coats of its pelvis, and consequent distension of its outer coat: This was a necessary consequence of the bladder's having reached its greatest possible distension, and so resisting the further influx of urine secreted in the kidney. We need only suppose the coats of the bladder here, whether from disease or naturally, stronger than those of the pelvis of the kidney, to account for the rupture not first taking place in the former, as most commonly happens.

This cyst, however, being limited in its distension by the neighbouring parts, while yet the secretion of urine was still going on, it is evident that fresh outlets must have been forced by mere mechanical causes: and thus we find another of the same kind formed upon the bladder itself, and which was on the increase when death occurred.

Divested of these adventitious circumstances, the case re-

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solves itself into some original affection of the bladder. But what this may have been, after all the display of dissection, is perhaps yet matter of mere conjecture.

1. Was it originally a paralysis of the muscular fibres of the bladder, and this accompanied with inflammation of the external coat,* causing the adhesion: and again this last proving an insurmountable obstacle to any recovery from the paralysis, which the youth of the patient would have entitled him to expect?† It is true, however, that adhesion is not always necessary to such an incurable state of the bladder; as from dissections,‡ similar fatal cases have occurred without adhesion; yet they were in aged subjects, among whom such affections may be expected from the beginning to proceed from bad to worse. If I might hazard an opinion, it would be, that but for the adhesion, a recovery would, in this instance, have taken place. Does Surgery or Physic furnish us with any means of destroying these?

2. In the late stages of these cases, when the patients passed an ordinary quantity of urine, why did not this still continue flowing, seeing the will of the patient coincided? No obstruction existed about the neck of the bladder or in the urethra, and the pressure of the neighbouring viscera, as well as that from much condensed air, must have been considerable.

3. Would the continued use of the catheter be of any avail in such cases? It is regretted that our patient would not submit to the trial of it, which was actually proposed after the perusal of the cases quoted above. Yet it could scarcely have failed to excite fresh distress at the place of adhesion: nor does former observation favour its use but as a palliative. A man in the Pennsylvania Hospital, affected with inability to pass urine from a fall, had it drawn off daily for three months, at the expiration of which time he died. The bladder was found hard, contracted and thickened.

* Inflammation of the one coat, and palsy of the other, are not incompatible; for the same strain or overstretching which would injure the tone of a muscular fibre, applied to an adjoining membrane, must lay the foundation of inflammation in it.

† It is certain that the adhesion would prevent the natural and full contraction of the muscular fibres, which, thus kept for a long time over-distended, might lose altogether their disposition to it. Early in the disease, the patient said, that, on attempting to pass urine, he felt as if a wall were placed across his bladder, evidently a sensation arising from the adhesion resisting contraction.

‡ Vide Encyclopædia, art. *Ischuria vesicalis.*

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ARTICLE II.

A short Account of the YELLOW FEVER *which appeared on Block-Island, in the Summer and Autumn of* 1801. *By* AARON COMSTOCK WILLEY, *Resident Physician there. Communicated by Dr.* M. FOOT.

BY the 2d of August ten persons were sick of the yellow fever: one of them died a few minutes after the arrival of myself and attendants on the island; the others were apparently upon the verge of dissolution. On the 6th another of the ten died. New cases were now daily occurring, and the disorder began to spread in various parts of the island, carrying great terror wherever it appeared.

The weather was uncommonly hot and dry. This state of weather, I was informed, had existed during several of the preceding months. Little or no dew was perceived to have fallen in the nights; vegetation was greatly injured; and the water drying from the ponds, left a considerable portion of their bottoms exposed to the action of heat. From these, and from the moist grounds, were constantly rising noxious miasmata, capable of affecting the olfactory organs to a great distance.

The fever continued to prevail, in a greater or less degree, till the middle of November, when it disappeared; but a few days of uncommonly warm weather excited two cases in the fore part of December.

On the 31st of August was a terrible thunder storm, such as the oldest inhabitants scarcely remember to have experienced. The electrical explosions were frequent and tremendous—the lightning dense and extensive. Its duration was nearly an hour. The rain was copious. At first I expected that this would suppress, or produce some favourable change in the epidemic. But I was unhappily disappointed. It continued to rage with unabated violence, and, if any thing, assumed a greater degree of malignity. The succeeding weather was not less favourable to its predominancy than that previous to the storm.

The degree of its prevalence may be conceived by the following statement. The island is calculated to contain seven thousand acres; one thousand or more of which is water. The number of inhabitants, by the last census, seven hundred and fourteen; of these about eighty were confined to their beds during a regular and severe course of the fever, besides a greater

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number, who, by an early application, had it arrested in its first attack. What rendered this disorder more formidable, was the remarkable degree of health, and exemption from epidemics, for which this island has always been distinguished.

Whether this disorder was imported, or generated upon the island, is a question which admits of some dispute. It is generally believed, by the inhabitants, to have been imported, about the beginning of April. But their account of its importation is fraught with much ambiguity and difficulty. I am rather inclined to think that it was indigenous, originating from the impression of deleterious gases; that it first assumed its characteristic features some time in June, and that those few febrile cases which occurred prior to this period, were only the common inflammatory fever, not unfrequent in the vernal season. But accurate observations are wanting to determine this with any degree of certainty.

It prevailed among people of every age, but was more violent in those who were in the bloom of life.

"This disease put on all the intermediate forms between a mild remittent and a typhus gravior." In general, however, it was subject to three stages, readily distinguishable from each other. The *first*, or *synochal* stage, was marked with the following symptoms. Pain in the fore or back part of the head, accompanied with slight vertigo, and soreness of the eye-balls; pain in the back part of the neck, and in the bones; soreness of the flesh; vitiated taste; anorexia; rigors, succeeded by sudden flushes of heat; costiveness, and dry skin. These two last phenomena were, in a *few* cases, superseded by diarrhœa and diaphoresis. Eyes and skin of a yellowish hue; aversion to light, vigilance, and great dejection of spirits. In several instances I observed a remarkable loss of energy, and a constant tendency to leipothymia. Sometimes a retching and puking. These more frequently occurred in August. The matter ejected from the stomach was frothy, black, or green, highly bilious, and of an acescent smell. The pulse, for the most part, was small and tense; sometimes, however, I met with a pulse full and hard, and but rarely any soft; hurried respiration; oppression in the region of the præcordia; urine high coloured; tongue commonly moist and covered with a thick fur. In August this fur was purple, or black, sometimes yellow, and but rarely white. In September it put on a more uniform yellow, or white appearance. In one instance the tongue was of a fiery red, and interspersed with white specks. A burning sensation in the stomach, thirst, great heat, and florid coun-

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remance. In several cases I observed a confusion of intellects, but never a complete delirium. These symptoms were exacerbated towards evening.

If the fever was not dissolved in this stage, it was sooner or later succeeded by the *second*, or *typhoid* stage. Here the vigour of the system suffered a rapid declension. The pain of the head and other parts subsided; the pulse became weak, soft, and generally small, though sometimes full and sluggish; the face was less florid; retching, and an increased ejection of bilious matter from the stomach. In two instances the matter ejected was intermixed with blood. Flatulent distensions of the stomach and abdomen; the tongue became more livid, or black, generally dry and cracked, and sometimes glazed; cold sweat about the neck and forehead; faltering speech, turbid urine, lips and fauces generally dry and starchy; increased confusion of intellects; sighing; a deadly aspect, and great debility.

If the disorder did not come to a favourable termination in this stage, it passed into the *third*, or *sinking stage*. This was the great portent of approaching death. The pulse was extremely feeble and fluttering, heat greatly diminished, except about the *scrobiculus cordis*; the extremities became cold and livid, and a cold clammy sweat burst from every part of the body; the eyes appeared extremely glazy, the vigour of the system underwent alternate risings and fallings; subsultus tendinum, great inquietude, lying chiefly upon the back, sliding down in the bed, and sometimes feeble efforts to rise; laborious respiration, with frequent intermissions, injured deglutition, and an involuntary discharge of fæces. These fatal symptoms, rapidly increasing, generally closed the melancholy scene within twelve hours from the time of their accession.

The respective lengths of these stages depended upon the constitution, sex, age, violence of the disorder, and state of the atmosphere. The duration of the first stage was commonly from three to ten days; the second, from three to twenty-five, and the last not more than twelve hours.

Besides the phenomena already noticed, the following demand some attention:—

1. *Tinnitus aurium, and defect of hearing.* Though I sometimes observed these to happen in the first, yet they more frequently occurred in the second stage, and were in proportion to the debility of the system. They gradually disappeared with returning health.

2. *Diarrhœa.* This was commonly of the lienteric

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species; it was confined to no particular period of the disorder. It sometimes occurred in convalescence, and greatly protracted recovery.

3. *Cough.* This was many times a concomitant, and frequently extremely troublesome. It was sometimes dry, at others humid. The latter was the most favourable.

4. *Glandular swellings.* In one case there occurred a swelling of the parotid glands. This was discussed. In two cases the disorder was followed by a tumefaction of the axillary glands. One of them terminated by resolution, the other in suppuration. A case of a young girl was accompanied with a phlegmonic tumor of the left breast, which ended in suppuration.

5. *Abscesses.* In one case the commencement of convalescence was attended with large abscesses upon the nates and inferior extremities.

6. *Intermitting pulse.* This frequently occurred in the latter part of August. In general it intermitted every third stroke. In two cases it intermitted every seventh stroke, in one every fifth, and in one the intermissions were irregular.

7. *Worms.* These were almost constant attendants; they were discharged in considerable numbers, and frequently crawled out of the mouth.

8. *Petechiæ.* I had but one case attended with petechial eruptions; they appeared on the twenty-eighth day of the disorder, and were the precursors of returning health.

9. Convalescence in one case was attended with great fatuity and mental derangement.

10. I saw two, who, in the sinking stage, appeared quite cheerful, and laughed but a short time before death. Dr. *Rush* observes, that this "frequently occurs in diseases which affect the brain and nerves."*

11. Two cases were succeeded by chronic rheumatism.

12. In females this disorder was generally followed by a *suppressio mensium.*

Having given a concise and accurate description of the phenomena of this disorder, I come now to consider the method of treatment, which I found to be most successful.

The indications of cure in the *first stage* were,

I. To moderate the synochal, or excessive action of the system.

II. To alleviate certain predominant symptoms which occasioned much distress to the patient.

* Account of the Yellow Fever in 1793, p. 75.

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I. The *first* indication was most certainly answered,

1. By avoiding the application of artificial or accidental stimuli.

2. By diminishing the sum of natural stimuli.

3. By the exhibition of those medicines which tended to abate the febrile affections.

The artificial, or accidental stimuli, more immediately requisite to be avoided, were those of aliment, light, external heat, and the mental impressions.

The sum of natural stimuli was diminished by,

1. *Blood-letting*. This, when performed previous to the third or fourth day of the disorder, was attended with great efficacy. It mitigated pain, lessened indirect debility, and removed or obviated congestions in the brain. The appearance of the blood, when drawn, exhibited all the marks of an inflammatory diathesis. The quantity requisite to be taken away was determined by the violence of the symptoms, together with a consideration of the age and sex. In general, however, the evacuation was continued till the pain of the head in some measure abated, and repeated as often as it returned, till the time for bleeding was elapsed.

2. *Purging*. The effects of this were similar to those of blood-letting. It exonerated the intestinal canal of redundant and offending matter, abstracted excess of stimulus, and diminished the morbid excitement of the system. The most eligible purges were those of the drastic species. In August, and the beginning of September, I found calomel, combined with jalap, to answer the intended purpose; but when the season became more advanced, calomel with gamboge was commonly the most and only effectual medicine; they were given in doses sufficient to excite from six to ten alvine discharges, and reiterated till the primæ-viæ were thoroughly deterged. If they were tardy in their operation, they were expedited by laxative clysters. These were occasionally followed by others, or more gentle cathartics, in order to keep the bowels free of the reaccumulating bile.

3. *Vomiting*. This was necessary only when an accumulation of morbid matter was in the stomach, which cathartics did not readily remove. The administration of this, as it respected the particular condition of the patient, and species to be used, required considerable caution. In strong and robust constitutions, I used tartarized antimony with success, but in delicate and irritable habits, ipecacuanha was the only emetic I dared to trust.

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4. *Subduction of heat.* As heat is a powerful stimulus in the animal system, its subduction became, of consequence, a matter of considerable importance. This was induced, *firstly*, by the application of cold, and, *secondly*, by the promotion of the cuticular excretion. 1. Cool air, and cool drinks were indispensably necessary. Of the last, cold water was the most beneficial; it was a great luxury to the thirsty patient. The face, neck and breast were frequently washed with cold water, and cloths wrung out of the same constantly applied to the bowels, and removed as often as they became warm. If pain occurred in the breast, stomach or bowels, vinegar was used instead of water; if this failed to give relief, cold fresh earth, wrapped in a thin cloth, was applied in the same manner. This last was of singular efficacy, and seemed to act upon the system with peculiar properties. 2. The cuticular excretion was promoted by a liberal use of diluent drinks, especially of vinegar whey.

The medicines which appeared best to abate the febrile affections were cream of tartar and nitre. From a free use of these I perceived the greatest benefits to accrue: they best answered the intended purpose when exhibited in solution, with a small addition of tartarized antimony.

II. The particular distressing symptoms which required alleviation, were,

1. *Violent pain in the head.* This generally yielded to the artificial evacuations, but often returned again with equal violence. When this was the case it frequently yielded to the application of cold water or vinegar, or if these failed, fresh earth. Epispastics to the nape of the neck were likewise of great benefit.

2. *Nausea and puking.* These were troublesome and sometimes stubborn symptoms. The medicines which I found to be of the greatest efficacy were tincture of opium, with elixir of camphor; columbo root in powder and infusion; julaps prepared with the essential oils of cinnamon, peppermint, and pennyroyal; external application of tincture of opium, and strong aromatic infusions, with a liberal use of the antiemetic drinks. If these symptoms depended upon morbid matter in the stomach, they yielded to gentle emetics and cathartics.

3. *Oppression and difficult respiration.* These were generally relieved by small and frequently repeated doses of camphorated solution of tartarized antimony.

The curative indications in the *second stage* were,

I. To support the declining vigour of the system.

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II. To moderate the febrile affections.

III. To alleviate those predominating symptoms which occasioned much distress.

1. The vigour of the system was supported by both internal and external means. The internal exhibitions were infusions of castor and wild valerian, decoctions of Peruvian bark, brandy diluted with water, wine whey, elixir of vitriol, dulcified spirits of vitriol, compound powder of ipecacuanha; and in cases of extreme debility, when the sinking stage appeared to be near, wine, bark in substance, camphor, ether, and the above mentioned essential oils. The external applications were sinapisms to the bottoms of the feet, epispastics upon the wrists, ancles, the whole length of the shin, and over the coronal suture, washing the face, breast and stomach with vinegar or diluted brandy; and in the latter part of the stage in brandy alone. Besides these remedies I frequently excited a slight ptyalism by means of mild muriated quicksilver, given in small and repeated doses, and by anointing the right hypochondrium with unguentum hydrargyri. This was followed with the most happy effects, and never failed in but one instance to turn the trembling scale in favour of life.

2. The febrile affections were best abated by the spirit of nitrous ether. To render this a better diaphoretic, I commonly added a small portion of antimonium tartarisatum.

3. The predominating symptoms necessary to be mitigated were,

1. *Retchings and vomiting.* For these I usually employed the same remedies mentioned in the synochal stage. When these did not afford relief, I applied an epispastic to the region of the stomach; and when this failed, I sometimes excited an inflammation in the salivary glands with success.

2. *Flatulences.* These were best obviated by keeping the bowels open: cathartics of castor oil, and infusions of aniseed commonly answered the desired end, when not rejected by the stomach; but when the stomach rejected things taken by the mouth, recourse was had to enemata and fomentation of the distended parts with brandy, and the infusion of aromatics.

The third or sinking stage being merely an augmentation or diversification of the *second*, required the same remedies, only more assiduously applied. Epispastics, however, were incapable of vesicating the skin, and mercury of inflaming the salivary glands.

Convalescence was, in general, slow, and frequently attended with hectical and anasarcous affections. Bark, bitters, cha-

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lybeates and corroborative syrups, with brandy and wine, easily digested aliment, and gentle exercise, were the best means to invigorate the system and accelerate recovery.

ARTICLE III.

Staten-Island, August 8, 1802.

SIR,

Enclosed I have attempted to give you a short description of the quarantine establishment, and a general account of the occurrences at this place in the last season. A particular detail of some of the sickly vessels, it is at present out of my power to furnish you with; but this shall be done as soon as I can procure them.

With the greatest respect,
I am your most obedient humble servant,
Dr. HAMMERSLY. *JOSEPH BAYLEY.*

THE Marine Hospital is very pleasantly situated on rising ground, near the water, within half a mile of the north-eastern extremity of Staten-Island. Thirty acres of ground, including the beach, have been purchased and appropriated to the purpose of erecting thereon all the requisite buildings for the objects of Quarantine. The buildings front the east, are eight miles distant from the city of New-York, and open to the sea breeze, which passes freely through them.

The ground about the establishment, for some distance, is very rough, being principally high uncultivated hills, upon which there is some shrubbery, chiefly cedars. A constant stream of water runs through the Quarantine Ground, which is derived from a number of springs, in a valley, within half a mile of the shore; these uniting their little rills afford a continual stream of water, which is of primary importance to this institution. There are seven separate buildings for the reception of sick; six of one story, and one of two, constructed of wood, well ventilated, being only twenty feet deep, windows opposite to each other, and ventilators at top; they will accommodate 200 patients. There are several other buildings, viz. a house for the Health Officer, another for the Revenue Officer, a boatman's house, gardener's, and wash-house, kitchens, and two very large stores.

Nine hundred and forty-five patients were admitted into the Marine Hospital, from May 1st, to December 1st, 1801. Their

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diseases were principally ship and yellow fever, and dysentery; one hundred and eighty-nine of them died. The following are the vessels from which they were chiefly sent.

Vessels names.	From whence.	Arrived.	Disease.	No. of sick.	Died.
Ship Venus,	Newry.	May 7.	Ship fever.	28	
—— Venus,	Dublin.	20.	Do.	27	1
Brig Recovery,	Greenock.	20.	Do.	3	
Ship Phœnix,	Do.	25.	Do.	3	1
—— Penelope,	Newry.	June 10.	Yellow and ship fever, small-pox and dysentery.	202	74
—— Enterprize,	Londonderry.	24.	Ship fever.	19	2
—— Ocean,	Havanna.	July 23.	Yellow fever.	5	2
Brig Flora,	Sligo.	29.	Ship fever.	192	38
—— Rambler,	New-York.	Aug. 12.	Yellow fever.	4	2
Barque Resolution,	Londonderry.	Sept. 16.	Ship fever.	48	2
Ship Nancy,	Sligo	28.	Ship fever and dysentery.	238	32

Most of the attendants of the institution were infected three or four times, and some were unable to do any duty for five or six weeks at a time; they generally sickened in a few days after a great number of patients had been suddenly admitted. There not being accommodations for more than fifty patients at the commencement of the season, and the ship Penelope arriving on the 10th of June, with upwards of one hundred and fifty sick on board, at which time there were twenty patients in the hospital, we were painfully necessitated to crowd forty in a ward forty feet by twenty, that could not comfortably contain more than sixteen. Eighty-four sick persons were taken out of this ship two days after her arrival, and crowded in this manner, which certainly comparatively much mended their situations, although we very soon felt the fatal effects of contaminated air; the three days following we pitched a few tents, and received fifty more sick from the ship. The Health Commissioners, immediately on her arrival, applied to the Corporation of the city of New-York, and obtained a grant of fifteen hundred dollars to erect buildings to accommodate them; and in a fortnight three buildings, forty feet by twenty, were put up; so that in the following eight days upwards of one hundred more sick were sent from among her passengers. The sails and spars of the ship were brought on shore, and the well passengers were employed in making shelter for themselves, that by removing them from the source of the disease, the progress of it might be checked. Forty-two of them died the first fortnight after her arrival. By the time the sick were rendered comfortable and the attendants had recovered from their indispositions, the brig Flora arrived, July 29, from Sligo. Sixty-three patients were in the hospital at this time, and in a few days the wards were again crowded with one hundred and ninety-two sick persons from this vessel. The great fatigue of the nurses

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on this occasion, and the air of the hospitals becoming again infected, caused many of them to sicken. The next severe trial we underwent was on the arrival of the ship Nancy, from Sligo; and this vessel exceeded all the others in the number of sick on board at her arrival, the filthy state they were in, as well as the ship itself, and the very offensive nature of their complaint, principally dysentery. Fifty-three were in the hospital when she came into this port, and one hundred and forty were received from her the two first days they were permitted to land the sick, and in a few days following ninety-two more, as fast as beds could be got ready for them. Room was not wanted, for a large two-story building, one hundred and twenty feet long, and twenty wide, which had been erected for the reception of the healthy passengers from sickly vessels, we were obliged to use for the sick; and the well were put under tents and temporary sheds. Although the precaution was taken to strip, wash them all over, and put clean linen on them before they were taken into the hospitals to their clean beds; and such as could not be furnished with clean linen, were put to bed naked, and the window shutters (for there are no sashes) were kept so constantly open during the day, that many complained so much of the cold that additional covering was given to them; yet all these measures did not prevent some of the attendants from being infected.

The ship Venus, of New-York, Captain Staunton, sailed from Newry, Ireland, March 13th, 1801, and arrived at the Quarantine anchorage, May 6th, navigated by ten persons, all in health; there were on board seventy cabin and steerage passengers; several were sick during the passage, and one child died; nine persons were ill on her arrival, and nineteen more sickened after they were landed. Their disease was ship fever, which usually on the ninth day was attended with a profuse sweat, which left the patient free from fever, but in a feeble state; the pulse becoming regular, returning appetite and refreshing sleep, all promised a speedy re-establishment of health. These pleasing prospects were of short duration, for twenty-seven of the twenty-eight, from the third to the seventh day after their complaint appeared to terminate so favourably, relapsed, commencing in the same manner as the first attack, with cold chills, sometimes with rigors, succeeded with hot and dry skin, constant thirst, full and frequent pulse. All the above cases terminated in health from the twenty-first to the twenty-third day from the commencement of the disease, by a very profuse sweat.

The prevailing report of the passengers was, that the dis-

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case was brought on board by a woman who came from the country, with her husband and child, to take passage for America; being late in the afternoon when they arrived in town, they lodged in a house where a person had died a short time before with a malignant fever, of which several persons had died at that place. This woman was taken ill a few days after the vessel was at sea; her husband and child were the next persons taken sick; (the child died), then those persons who occupied the next birth to them; soon after those who were farthest off, as well as those who were nearest, were indiscriminately seized.

The ship Enterprize, of New-York, Capt. Fortescue Cumming, sailed from Londonderry, May 3d, and arrived here June 21st, 1802, navigated by thirteen persons, all in perfect health. Cargo, a few linens and ballast. Two hundred and ninety-six passengers; all in health since they have been on board; two children died on the passage.

This vessel was permitted to proceed to the city with all her people on board; the commander took every precaution to keep the passengers healthy, by steering in a northern latitude as far as his course would permit, by ordering all their bedding on deck every day the weather would admit, and having the places they occupied washed out and sprinkled with vinegar frequently. Notwithstanding all these precautions, some of the passengers must have been under the influence of confined air when the ship arrived, although I believe unknown to the captain, for, on the 26th June, two young women who came in this vessel were sent by the Resident Physician to the Marine Hospital, both very ill with ship fever, and had been sick three or four days; on the 28th four others were sent, who came in the same ship, with the same disease, and on the 30th six more; of these twelve two died: it was known, at this time, that a number of them were sick in the city. The Hospital, on Staten-Island, and a number of tents were crowded with fever patients. The Health-Officer requested the Health Commissioners to propose to the Corporation to open Bellevue Hospital; but, instead of this they made a second grant of one thousand five hundred dollars, to erect buildings for their accommodation, and arrangements were made for one or two wards, in the New-York Hospital, to receive the emigrants that sickened in the city until these buildings could be put up.

The Barque Resolution, Capt. Geddings, sailed from Londonderry, July 18th, and arrived at Quarantine Sept. 11th. navigated by eleven persons, in health during the voyage. This

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vessel had on board 200 passengers; three children died on the passage, and a few persons were sick on her arrival. During her detention 43 persons were sent from her to the hospital with ship fever; two of them died. Cargo, coals and linens.

Ship Nancy, Capt. John Heron, sailed from Sligo, July 12th; arrived at Quarantine Sept. 27; navigated by 9 persons, all unwell; had on board when the vessel left Ireland, 417 passengers; the ship lay there a long time receiving them; of this number 80 died on the passage, and about 150 sick; on her arrival scarce a healthy countenance to be seen on board; cargo, linen. The distress exhibited on board this ship surpassed all I had ever before seen; one half unable to do any thing for themselves, and the other half from their weak state could with difficulty take care of themselves, consequently very little assistance was given to those who were ill: their diseases were ship fever and dysentery, and between the decks, where they lay, was the receptacle of their intestinal evacuations, in such quantity, that it ran out of the scuppers, soiled the sides of the vessel and the rigging to such extent that the Health Officer could not get on board; the upper deck was over shoes in filth, and the people themselves as unsightly in clothing and person as dirt could make them: two men expired as soon as they were landed.

This ship was chartered by a commercial house in Sligo, for the express purpose of bringing people to America, if they could live through the famine and pestilence that awaited them. That more persons might he stowed away than the accommodation of the ship would allow of, temporary births were fitted on deck, in which about 100 of these distressed emigrants were destined to be eleven weeks; six feet in length by five in breadth, just high enough to sit up in, and a door to creep in at, was allotted for four persons each. Their provisions of beef, pork, and fish were of the worst sort; the water was put in casks that had been used for salted meat, and was so offensive and bad that it could, for the latter part of the passage, be used only in gruel.

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ARTICLE IV.

Facts intended to prove the Yellow Fever *not to be contagious, and instances of its supposed Contagion explained upon other principles. By* Benjamin Rush, *M. D. Professor of Medicine in the University of Pennsylvania; in a Letter to Dr.* Edward Miller.

Dear Sir,

When fevers are communicated from one person to another, it is always in one of the following ways: 1st. By secreted matters. 2dly. By excreted matters. The small-pox and measles are communicated in the former way; the jail, or, as it is sometimes called, the ship and hospital fever, is communicated only by means of the excretions of the body. The perspiration, by acquiring a morbid and irritating quality, more readily than any other excretion, in consequence of its stagnation and confinement to the body in a tedious jail fever, is the principal means of its propagation. The perspiration* is, moreover, predisposed to acquire this morbid and acrid quality, by the filthiness, scanty or bad aliment, and depression of mind, which generally precede that fever. It is confined to sailors and passengers in foul and crowded ships, to prisoners and patients in foul and crowded jails and hospitals, and to poor people who live in small, damp, and confined houses. It prevails chiefly in cool and cold weather, but is never epidemic; for the excreted matters which produce the fever do not float in the external atmosphere, nor are they communicated so as to produce disease, more than a few feet from the persons who exhale them. They are sometimes communicated by means of the clothes which have been worn by the sick, and there have been instances in which the fever has been produced by persons who had not been confined by it, but who had previously been exposed to all the causes which generate it. It has been but little known in the United States since the revolutionary war, at which time it prevailed with great mortality in the hospitals and camps of the American army. It has now and then appeared in ships that were crowded with passengers from

* The deleterious nature of this fluid, and its disposition to create disease, under the above circumstances, has been happily illustrated by Dr. Mitchill, in an ingenious Letter to Dr. Duncan, of Edinburgh, published in the 4th volume of the Annals of Medicine.

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different parts of Europe. It is a common disease in the manufacturing towns of Great-Britain, where it has been the subject of several valuable publications, particularly by Dr. Smith, and Dr. John Hunter. Dr. Haygarth has likewise written upon it, but he has unfortunately confounded it with the West-India and American yellow fever, which differs from it, in prevailing chiefly in warm climates and seasons; in being the offspring of dead and putrid vegetable and animal matters; in affecting chiefly young and robust habits; in being generally accompanied with a diseased state of the stomach, and an obstruction or preternatural secretion and excretion of bile; in terminating most commonly within seven days; in becoming epidemic *only* by means of an impure atmosphere, and in not furnishing ordinarily those excretions which when received into other bodies, reproduce the same disease.

That the yellow fever is not contagious in its simple state, and that it spreads exclusively by means of exhalations from putrid matters, which are diffused in the air, is evident from the following considerations:

1. It does not spread by contagion in the West-Indies. This has been proved in the most satisfactory manner by Doctors Hillary, Huck, Hunter, Hector M'Lean, Clark, Jackson, Borland, Pinkard, and Scott. Dr. Chisholm stands alone, among modern physicians, in maintaining a contrary opinion. It would be easy to prove, from many passages in the late edition of the Doctor's learned and instructive volumes, that he has been mistaken; and that the disease was an endemic of every island in which he supposed it to be derived from contagion. Of this, the fullest evidence will shortly be laid before the public by Dr. Caldwell.

2. The yellow fever does not spread in the country when carried thither from the cities of the United States.

3. It does not spread in yellow fever hospitals, when they are situated beyond the influence of the impure air in which it is generated.

4. It does not spread in cities (as will appear hereafter) from any specific matters emitted from the bodies of sick people.

5. It generally requires the co-operation of an *exciting* cause, with miasmata, to produce it. This is never the case with diseases which are universally acknowledged to be contagious.

To the first four of these assertions there are some seeming exceptions in favour of the propagation of this fever by contagion. I shall briefly mention them, and endeavour to explain them upon other principles.

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The circumstances which seem to favour the communication of the yellow fever from one person to another, by means of what has been supposed to be contagion, are as follow:

1. A patient being attended in a small, filthy, and *close* room. The excretions of the body, when thus accumulated, undergo an additional putrefactive process, and acquire the same properties as those putrid animal matters which are known to produce malignant fevers. I have heard of two or three instances in which the yellow fever was propagated by these means in the country, remote from the place where it originated, as well as from every external source of putrid exhalation. The plague is sometimes propagated in this way in the low and filthy huts which compose the alleys and narrow streets of Cairo, Smyrna, and Constantinople.

2. A person sleeping in the sheets, or upon a bed impregnated with the sweats or other excretions, or being exposed to the smell of the foul linen, or other cloathing of persons who had the yellow fever. The disease here, as in the former case, is communicated in the same way as from any other putrid animal matters. It was once received in Philadelphia from the effluvia of a chest of unwashed clothes, which had belonged to one of our citizens who had died with it in Barbadoes; but it extended no further in a large family than to the person who opened the chest. I have heard of but two instances more of its having been propagated by these means in the United States, in which case the disease perished with the unfortunate subject of it; for the superstitious dread of contagion has generally produced, not only great care in washing sheets and clothes, and airing beds supposed to be infected, but frequently the total destruction of them by fire and water.

I am disposed to believe the linen, or any other cloathing of a person in good health that had been strongly impregnated with sweats, and afterwards suffered to putrefy in a confined place, would produce the same disease as in the cases above-mentioned.* The changes which the healthy excretions by the pores undergo by putrefaction, may easily be conceived, by recollecting the offensive smell which a pocket handkerchief acquires that has been used for two or three days to wipe away the sweat of the face and hands in warm weather.

3. The protraction of a yellow fever to such a period as to dispose it to assume the symptoms, and to generate the peculiar and highly volatilized exhalation from the pores of the

* See Van Swieten on Epidemic Diseases, Aphorism 1408.

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skin, which takes place in the jail fever. I am happy in finding I am not the author of this opinion. Sir John Pringle, Dr. Monro, and Dr. Hillary, speak of a contagious fever produced by the combined action of marsh and human miasmata. The first of those physicians supposes the Hungarian bilious fever which prevailed over the continent of Europe in the seventeenth century, was sometimes propagated in this way, as well as by marsh and other putrid exhalations. Dr. Richard Pearson, in his observations upon the bilious fevers which prevailed in the neighbourhood of Birmingham, in England, in the years 1797, 1798 and 1799, has the following remark: "In its first stage, this fever did not appear to be contagious, but it evidently was so after the eleventh and fourteenth day, when the *typhoid* state was induced."* As this protracted state of bilious fever rarely occurs in our country, it has seldom been communicated in this way.

It is not peculiar, I believe, to a bilious and yellow fever, when much protracted beyond its ordinary duration, to put on the symptoms of the jail fever. The same appearances occur in the pleurisy, and in other, of what Dr. Sydenham calls *intercurrent* fevers, all of which I have no doubt, under certain circumstances of filth and confinement, would produce a fever in persons who were exposed to it. This fever, if the weather were cold, would probably put on inflammatory symptoms, and be added, in our nosologies, to the class of contagious diseases.

4. Miasmata, whether from marshes, or other external sources, acting upon a system previously impregnated with the excreted matters which produce the jail or ship fever. Mr. Lempriere informs us, that he saw what were supposed to be cases of yellow fever communicated by some sailors who brought the seeds of the ship fever with them to the island of Jamaica. The fevers which affected most of the crews of the Hussar frigate, mentioned by Dr. Trotter,† and of the Busbridge Indiaman, described by Mr. Bryce,‡ appear to have been the effect of the combined operation of foul air in those ships, and human excretions upon their systems. The disease was barely tinged with bilious symptoms, and hence the facility with which it was cured, for the jail fever more readily yields to medicine than the yellow fever. The former was probably excited by some latent exhalation from dead matters in the

* Page 13.
† Medicina Nautica, p. 360.
‡ Annals of Medicine, vol. i. p. 116.

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holds of the ships, and hence we find it ceased on shore, where it was deprived of its exciting cause. It is true, great pains were taken to clean the hold and decks of the Busbridge, but there are foul matters which adhere to the timbers of ships, and which, according to Dr. Lind, are sometimes generated by those timbers when new, that are not to be destroyed by any of the common means employed for that purpose. Of this Dr. Kollock has furnished us with a most satisfactory proof in his history of the yellow fever, which prevailed on board of the frigate General Greene, on her voyage to the Havanna, in the year 1799. "The air in the hold of the vessel (says the Doctor) was so contaminated, as to extinguish lights immediately, and candles in the cockpit were almost as useless from the same cause. The fish were thrown overboard, and the decks washed and scoured, the ventilator and wind sails put in motion, and every measure of purification adopted that their situation allowed; notwithstanding these precautions, disease invaded us. The men were unceasing in their exertions to purify the ship; washing, scouring with vinegar, burning powder and vinegar, old junk, and sulphur, added to constant ventilation, proved unequal even to the amelioration of their calamities, while they were in the latitude of *great heat.* After the removal of the sick, the ship was disburthened of her stores, ballast, &c. cleansed and white-washed throughout; still new cases occurred for nearly two months. Some days, two, three or four, were sent off to the hospital, which would seem to indicate the retention of some portion of this noxious principle, which was lodged beyond the reach of the cleansing process." That this noxious principle or matter existed in the ship, and not in the bodies of the crew, is evident, from its not having been communicated in a single instance by a hundred of them who were sent to a hospital on Rhode-Island, notwithstanding an intercourse sufficient to propagate it was necessarily kept up with the inhabitants. Even their nurses did not take it.*

A fifth instance in which contagion has been supposed to take place in the yellow fever is, where the exhalation from the excretions of a patient in that disease acts as an *exciting* cause, in persons previously impregnated with the marsh, or other external miasmata, which produce it. The activity of this exhalation, even when it is attended with no smell, is so great, as to induce sickness, head-ache, vertigo and fainting. It is not peculiar to the exhalations from such patients to produce mor-

* Medical Repository, vol. iv. No. 1.

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bid effects upon persons who visit them. The odour emitted by persons in the confluent small-pox has been known to produce the same symptoms, together with a subsequent fever and apthous sore-throat. This has been remarked long ago by Dr. Lind, and latterly by Dr. Willan, in his reports of the diseases of London.* That the yellow fever is often excited in this way, without the intervention of a supposed specific contagion, I infer from its sometimes spreading through whole families, who have breathed the same impure atmosphere with the person first affected by the fever. This is more especially the case where the impression made by the exhalation from the sick person is assisted by fear, fatigue, or anxiety of mind in other branches of the family. In favour of this mode of exciting the yellow fever, Dr. Otto communicated to me the following fact. In the autumn of the year 1798, it prevailed upon the *shores* of the Delaware, in Gloucester county, in New-Jersey. A mild remittent prevailed at the same time on the *high* grounds, a few miles from the river. During this time, the Doctor observed, if a person who had taken the yellow fever in Philadelphia afterwards came into a family *near* the river, the same disease appeared in several instances in one or more branches of that family; but where persons brought the fever from the city, and went into a family on the *high* grounds, where the mild remittents prevailed, there was not a single instance of a yellow fever being excited by them in any of its members. This fact is important, and of extensive application. It places the stimulus from the exhalations of persons affected by the yellow fever upon a footing with intemperance, fatigue, heat, and all the common exciting causes of the disease; none of which it is well known can produce it, except in persons who have previously inhaled the putrid miasmata, which in all countries are its only remote cause. The city of Philadelphia has furnished in all our yellow fever years many additional proofs of the correctness of Dr. Otto's remark. In the months of July and August, when miasmata are generally local, and float chiefly near to their hot beds, the docks and holds of ships, persons who are affected by these miasmata, and sicken in other parts of the city, never communicate the disease; but after the less prepared and heterogeneous filth of our whole city has been acted on by an autumnal, as well as summer sun, so as to emit pestilential exhalations into all our streets and alleys, the fever is now and then excited in

* Page 13 and 113.

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the manner that has been mentioned, by a single person in a whole family. The common intermittents of the southern states are often excited in the same way, without being suspected of spreading by contagion. Even the jail or hospital fever is vindicated by Dr. Hunter, from the highly contagious nature which has been ascribed to it upon the same principle. His words, which are directly to my purpose, are as follow: "In considering the extent and power of the contagion (meaning of the jail or hospital fever), I am not inclined to impute to this cause the fevers of all those who are taken ill in one family after the first, as they are all along exposed to the same vitiated air which occasions the first fever. In like manner, when a poor woman visits some of her sick neighbours, and is taken ill herself, and afterwards some of her children, I would not impute the disease to infection alone; she and her family having previously lived in the same kind of vitiated air which originally produced the fever. If the cases in which the infection meets with the poison already *half-formed* be excepted, the disease in itself will be found to be much less infectious than has been commonly supposed."* By the modes of communicating the yellow fever which have been admitted, the dysentery, and all the milder forms of autumnal fevers, have been occasionally propagated, and perhaps oftener than the first named disease, from their being more apt to run on to the typhus or chronic state. Of this I could adduce many proofs, not only from books, but from my own observations; but none of these diseases spread by contagion, or become epidemic from that cause in any country. A contrary opinion, I know, is held by Dr. Cleghorn, and Dr. Clarke; but they have deceived themselves, as they formerly deceived me, by not attending to the difference between secreted contagions and morbid excretions from the body, produced by the causes which have been enumerated, and which are rare and accidental concomitants of bilious or summer diseases.

6. The last instance of supposed contagion of the yellow fever, is said to arise from the effluvia of a putrid body that has died of that disease. The effluvia in this case act either as the putrefied excretions mentioned under the first head, or as an exciting cause upon miasmata, previously received into the system. A dead body, in a state of putrefaction from any other disease, would produce, under the same circumstances of season and predisposition, the same kind and degrees of fever.

* Medical Transactions, vol. iii. p. 351.

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From the explanation that has been given of the instances of supposed contagion of the yellow fever, we are compelled to resort to certain noxious qualities in the atmosphere, as the exclusive causes of the prevalence, not only of that fever, but (with a few exceptions) of all other epidemic diseases. It is true, we are as yet ignorant of the precise nature of those qualities in the air which produce epidemics; but their effects are as certainly felt by the human body as the effects of heat, and yet who knows the nature of that great and universal principle of activity in our globe?

That the yellow fever is propagated by means of an impure atmosphere at all times, and in all places, I infer from the following facts.

1. It appears only in those climates and seasons of the year in which heat, acting upon moist animal and vegetable matters, fills the air with their putrid exhalations.

2. It is unknown in places where a connection is not perceptible between it, and marshes, mill-ponds, docks, gutters, sinks, unventilated ships, and other sources of noxious air. The truth of this remark is established by many facts in Mr. Lempriere's excellent history of the diseases of Jamaica, and by most of the writers upon tropical diseases. There is likewise no exception to it in the United States.

3. It is destroyed, like its fraternal diseases, the common bilious and intermitting fevers, by means of *long-continued* and *heavy* rains.* When rains are heavy, but of short duration, they suspend it only in warm weather; but when they are succeeded by cold weather, they destroy all the forms of bilious fever. The malignant tertians described by Dr. Cleghorn, always ceased about the autumnal equinox; for at that time, says the Doctor, "Rain falls in such torrents as to tear up trees by the roots, carry away cattle, break down fences, and do considerable mischief to the gardens and vineyards; but after a long and scorching summer they are very acceptable and beneficial, for they mitigate the excessive heat of the air, and give a check to epidemical diseases.†

4. It is completely destroyed by frost. Now as neither rains nor frosts act in sick rooms, nor affect the bodies of sick people, they must annihilate the disease by acting exclusively upon the atmosphere. Very different in their nature are the small-pox and measles, which are propagated by specific contagion. They

* Clarke on the Diseases of long Voyages to hot Climates, p. 116.
† Diseases of Minorca, p. 8.

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do not wait for the suns of July or August, nor do they require an impure atmosphere, or an exciting cause, to give them activity. They spread in the winter and spring as well as in the summer and autumnal months; wet and dry weather do not arrest their progress, and frost (so fatal to the yellow fever), by rendering it necessary to exclude cold air from sick rooms, increases the force of their contagion, and thereby propagates them more certainly through a country.

It has often been asked, why do not the putrid matters which produce yellow fever in some years, produce it every year? This question might be answered by asking several others. Why does not the matter which produces the malignant sore throat (which is certainly a domestic disease), produce it every year? Why does the dysentery rise up in our own country, and spread sickness and death through whole families and villages in one year, and disappear from the same places for fifteen or twenty years afterwards? All these questions may be answered by resolving the cause into a concurrence of what has been called an inflammatory or malignant constitution of the atmosphere, the effects of which are no less obvious upon the small-pox and measles than they are upon the former diseases which have been mentioned.

This malignant state of the air has been noticed by all writers upon epidemics, in all the nations of Europe, from Hippocrates down to the present day. An acknowledgment of its influence has lately been made on this side the Atlantic, by Dr. Baltazar de Villalobos, in a history of a pestilential fever which lately prevailed in Chancay, in South-America, a copy of which was put into my hands last summer by Dr. Seip, soon after his return from Lima.* I am sorry to add, the existence of this "to theion" of the father of physic was denied for the first time in the United States. It is to no purpose to say its presence has not been detected by any chemical agents. The same thing has been justly said of the exhalations which produce the bilious intermitting, remitting and yellow fever. No experiment that has yet been made has discovered their presence in the air. The eudiometer has been used in vain for this purpose. In one experiment made by Dr. Gattani, the air from a marsh at the mouth of the river Vateline was found to be apparently purer by two degrees than the air on a neighbouring mountain, which was two thousand eight hundred and eighty feet higher

* Y descripcion de la feibre Epidemica que por los Anos de 1796 y 1797, affligio varis poblaciones del partido de Chancay, p. 32, 33.

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than the sea. The inhabitants of the mountain were notwithstanding healthy, while those who lived in the neighbourhood of the marsh were annually afflicted with bilious and intermitting fevers.* The contagions of the small-pox and measles consist of matter, and yet who has ever discovered this matter in the air? We infer the existence of those remote causes of diseases in the atmosphere only from their effects. Of the existence of putrid exhalations in it there are other evidences besides bilious and yellow fevers. They are sometimes the objects of the sense of smelling. We see them in the pale or sallow complexions of the inhabitants of the countries which generate them, and we observe them occasionally in the diseases of several domestic animals.

The advocates for the yellow fever being a specific disease, and propagated only by contagion, will gain nothing by our admitting an inflammatory constitution of the atmosphere (the cause of which is unknown to us), to be necessary to raise common remittents to that grade in which they become malignant yellow fevers. They are obliged to have recourse to an unknown quality in the air every time they are called upon to account for the disease prevailing chiefly in our cities, and not spreading when it is carried from them into the country. The same reference to an occult quality in the air is had by all the writers upon the plague, in accounting for its immediate and total extinction when it is carried into a foreign port.

In speaking of the influence of an inflammatory constitution of the atmosphere in raising common bilious to malignant yellow fevers, I wish not to have it supposed that its concurrence is necessary to produce sporadic cases of that or any other malignant disease. Strong exciting causes, combined with highly volatilized and active miasmata, I believe, will produce a yellow fever at any time. I have seen one or more such cases almost every year since I settled in Philadelphia, and particularly when my business was confined chiefly to that class of people who live near the wharves, and in the suburbs, and who are still the first, and frequently the only victims of the yellow fever.

From the account that has been given of the different ways in which this disease is communicated from one person to another, and from the facts which establish its propagation exclusively through the medium of the atmosphere, when it be-

* Alibert's Dissertation sur les Fievres pernicieuses at Attaxiques Intermittentes, p. 185.

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comes epidemic, we may explain several things which belong to its history, that are inexplicable upon the principle of its specific contagion.

1. We learn the reason why, in some instances, the fever does not spread from a person who sickens or dies at sea, who had carried the seeds of it in his body from a sickly shore. It is because no febrile miasmata exist in the bodies of the rest of the crew to be excited into action by any peculiar smell from the disease, or by fear or fatigue, and because no morbid excretions are generated by the person who dies. The fever which prevailed on board the Nottingham East-Indiaman, in the year 1766, affected those forty men only who had slept on shore on the island of Joanna twenty days before. Had the whole crew been on shore, the disease would probably have affected them all, and been ascribed to contagion generated by the first persons who were confined by it.* A Danish ship, in the year 1768, sent twelve of her crew on shore for water. They were all seized after their return to the ship with a malignant fever, and died without infecting any person on board, and from the same causes which preserved the crew of the Nottingham Indiaman.†

2. We learn the reason why the disease sometimes spreads through a whole ship's crew apparently from one or more affected persons. It is either because they have been confined to small and close births by bad weather, or because the fever has been protracted to a typhus or chronic state, or because the bodies of the whole crew are impregnated with morbid miasmata, and thus predisposed to have the disease excited in the manner that has been mentioned. In the last way it was excited in most of the crew of the United States frigate in the Delaware, opposite to the city of Philadelphia, in the year 1797. It appears to have spread from a similar cause, from a few sailors, on board the Grenville Indiaman, after touching at Batavia. The whole crew had been predisposed to the disease by inhaling the noxious air of that island.

The same reasons account for the fever expiring in a healthy village or country; also for its spreading, when carried to those towns which are seated upon creeks or rivers, and in the neighbourhood of marsh exhalations. It has uniformly perished in the high and healthy village of Germantown, when carried from Philadelphia, and has three times appeared to be con-

* Observations on the Bilious Fevers usual in voyages to the East-Indies, by James Badinach, M. D. Medical Observations and Inquiries, vol. iv.

† Clarke on the Diseases of long Voyages to hot Climates, p. 123, 125.

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tagious near the muddy shores of the creeks which flow through Wilmington and Chester.

3. From the facts that have been mentioned, we are taught to disbelieve the possibility of the disease being imported in the masts and sails of a ship, by a contagious matter secreted by a sailor who may have sickened or died on board her on a passage from a West-India island. The death in most of the cases of contagion, supposed to be imported in this way, occurs within a few days after the ship leaves her West-India port, or within a few days after her arrival. In the former case, the disease is derived from West-India miasmata; in the latter, it is derived either from the foul air of the hold of the ship, or of the dock or wharf to which the ship is moored.

It is a good practice to measure the truth or error of opinions in science by the influence they are calculated to produce upon national, physical, and moral happiness.

A belief in the non-contagion of the yellow fever, and of its being incommunicable except in one of the five ways that have been mentioned, is calculated to produce the following good effects:

1. It will deliver the States which have sea-ports, from four-fifths of the expenses of their present quarantine laws and lazarettoes. A very small apparatus in laws and officers would be sufficient to prevent the landing of persons affected by the ship fever in our cities, and the more dangerous practice of ships pouring streams of pestilential air, from their holds, upon the citizens who live near our docks and wharves.

2. It will deliver our merchants from the losses incurred by the delays of their ships by long and unnecessary quarantines. It will, moreover, tend to procure the immediate admission of our ships into foreign ports, by removing that belief in the contagious nature of the yellow fever which originated in our country, and which has been spread by the public acts of our Legislatures and Boards of Health throughout the globe.

3. It will deliver our citizens from the danger to which they are exposed by spending the time of the quarantine on board of vessels in the neighbourhood of the marshes, which form the shores of the rivers or coasts of quarantine roads. This danger is much increased by idleness, and by the vexation which is excited by sailors and passengers being detained unnecessarily fifteen or twenty days from their business and friends.

4. It will lead us to a speedy removal of all the excretions, and a constant ventilation of the rooms of patients in the yellow

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fever, and thereby to prevent the accumulation and further putrefaction of those exhalations which may reproduce it.

5. It is calculated to prevent the desertion of persons in the yellow fever by their friends and families, and to produce caution in them to prevent the excitement of the disease in their own bodies, by means of low diet and gentle physic, proportioned to the impurity of the air, and to the anxiety and fatigue to which they are exposed in attending the sick.

6. It will put an end to the cruel practice of quieting the groundless fears of a whole neighbourhood, by removing the poor who are affected by the fever from their houses, and conveying them, half dead with disease and terror, to a solitary or crowded hospital.

7. By deriving the fever from our own climate and atmosphere, we shall be able to foresee its approach in the increased violence of common diseases, in the morbid state of vegetation, in the course of the winds, in the diseases of certain brute animals, and in the increase of common, or the appearance of uncommon insects.

8. A belief in the non-contagion of the yellow fever, and its general prevalence from putrid animal and vegetable matters *only*, is calculated to lead us to drain or cover marshy grounds, and to remove from our cities all the sources of impure air, whether they exist in holds of ships, in docks, gutters, and common sewers, or in privies, gardens, yards and cellars, more especially during the existence of the signs of a malignant constitution of the air mentioned under the preceding head. By these means I believe (the assertion is not too bold a one) the yellow fever might be as effectually annihilated as the small-pox will probably soon be by vaccination. A fever, the same in its causes and similar to it in many of its symptoms, that is, the plague, has been extirpated by extraordinary degrees of cleanliness, from the cities of Holland, Great-Britain, and several other parts of Europe.

You will perceive from the facts and reasonings contained in this letter, that I have relinquished the opinion published in my account of the yellow fever in the years 1793, 1794 and 1797, respecting its contagious nature. I was misled by Dr. Lining, and several West-India writers, in ascribing a much greater extent to the excreted matters in producing the disease than I have since discovered to be correct. You will perceive, likewise, that I have changed my opinion respecting the manner in which the plague is propagated. I once believed, upon the authorities of travellers, physicians, and schools of medi-

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cine, that it was a highly contagious disease, generated chiefly by miasmata from living but diseased bodies. I am now satisfied this is not the case. It is the offspring, like the yellow fever, of exhalations from putrid vegetable and animal matters; but from the greater number of people who are depressed and debilitated by poverty and famine, and who live in small and filthy huts* in the cities of the Ottoman Empire, than in the cities of the United States, I believe it to be more frequently communicated from an intercourse with sick people by the morbid excretions of the body, than the yellow fever is in our country. For my change of opinion, upon this subject, I am indebted to Dr. Caldwell's and Mr. Webster's publications upon Pestilential Diseases, and to the travels of Mariti and Sonnini into Syria and Egypt. I reject, of course, with the contagious quality of the plague, the idea of its ever being imported into any country so as to become epidemic, by means of a knife case, a piece of cotton, or a bale of silks, with the same decision that I do all the improbable and contradictory reports of an epidemic yellow fever being imported in a sailor's jacket, or in the timbers and sails of a ship that had been washed by the salt water, and fanned by the pure air of the ocean, for several weeks on her passage from the West-Indies to the United States.

It gives me pleasure to find this unpopular opinion of the non-contagion of the plague is not a new one. It was held by the Faculty of Medicine, in Paris, in the beginning of the eighteenth century, and it has since been defended by Dr. Stoll, of Vienna, Dr. Samoilowitz, of Russia, and several other eminent physicians. Dr. Heberden, jun. has lately called in question the truth of all the stories that are upon record of the plague having been imported into England in the last century; and the researches of the physicians who accompanied the French army into Egypt, it is said, have produced the most satisfactory proofs of its not being contagious in its native country.

I am aware of the influence which such changes in medical opinions as I have acknowledged have upon a physician's reputation; but small, indeed, should I consider the total sacrifice of mine, could it avert the evils which are connected with a belief in the importation of pestilential diseases, and insure the benefits to the world which would necessarily flow from the

* M. Savary, in his travels, says, two hundred persons live in Cairo within a compass that accommodates but thirty persons in Paris.

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establishment of the principles contained in this letter. I expect but little success from it. My principal design in writing it is to deduct that portion from the misery produced by plagues and yellow fevers, which my former opinion of the manner in which they are propagated may possibly have created. Even this consolation, I fear, will be denied to me in Philadelphia; for, with as little reason as formerly in favour of imported contagion, the majority of our citizens who believe in it, is greater and more decided than in former years. Never has the unity of our autumnal fever been more clearly demonstrated than in our present epidemic. Its four principal grades, viz. The intermittent, the mild remittent, the inflammatory bilious fever, and the malignant yellow fever, have all run into each other in many instances. A tertian has ended in death with a black vomiting; and a fever, with the face and eyes suffused with blood, has ended in a quotidian, which has yielded to a few doses of the bark. The fever in Baltimore, I have been informed, has put on exactly the same multiform appearances and changes. But in vain have these facts, and many others equally striking, been urged in favour of the domestic origin of our present fever. Our citizens indolently repose in a belief that it was derived from a vessel, on board of which two persons died on her passage from St. Domingo. This execrated, but harmless vessel, was thoroughly cleansed at the Lazaretto, where she lay twenty days, and no person who worked on board of her has died, or been indisposed since her arrival. It is probable several cases of fever may have originated from the foul air of some other vessels, but the greatest part of them have been evidently derived from putrid exhalations from our docks, wharves, yards and cellars in different parts of the city. Not an instance has been seen of the disease spreading by contagion. Where more than one in a family have been affected, it was obviously derived from the same putrid source. Some of our citizens admit the possibility of the disease originating from the noxious air of a ship, but do not see the sameness in the nature of foul air, whether it be generated in the hold of a ship, or by putrid matters on shore. They moreover confound this air with a supposed specific contagion generated in the body of a patient in the yellow fever. I have deplored the continuance of all these errors, so fatal to the lives, and injurious to the property of our citizens, but I have deplored them in silence. By ceasing to oppose them, I have hoped a calm and unprejudiced examination of facts would take place. This is all that is necessary to produce a conviction, that the yellow fever is not

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derived from specific contagion; that it is always generated by putrefaction; that it is not contagious, in its simple state, and that it never *was, is not*, and (while the laws of nature retain their present order), *never can be* imported so as to become an epidemic in any country.

From your sincere friend,
BENJAMIN RUSH.

Philadelphia, October 8, 1802.

ARTICLE V.

An INQUIRY *into the* UTILITY *of occasional* BLOOD-LETTING *in the* PREGNANT STATE *of* DISEASE: *Communicated in a Letter from Dr.* JOHN VAUGHAN, *of Wilmington (Delaware), to Dr.* MILLER.

[Continued from p. 57, and concluded.]

IT is somewhat remarkable that the objections to blood-letting, in this diseased state, are predicated on the supposition of general debility being induced by the support and growth of the fœtus; when, in fact, several pounds of blood, ordinarily evacuated from the system, are retained for ten lunar months, and deposited in the uterus. If the human fœtus were, on its first evolution, extruded from the mother, and nourished by an evacuation from her system, these objections would be entitled to weight; but when the reverse is the fact, they, of course, are invalid. The only human condition to which these arguments are applicable is that of suckling. In the latter case the child is supported by a drain from the mother's system, and she frequently becomes enfeebled, though the catamenia be retained, to provide for the nutrition of the new-born child. And when mothers continue nurses beyond the period designed by nature, they generally receive a friendly admonition, by an *effort*, or actual return of the constitutional evacuation, to resign the pleasurable office of suckling.

Mr. White, in his "Treatise on the Management of Pregnant and Lying-in Women," &c. declaims warmly against the practice of blood-letting in pregnancy, and adduces the authority of the Father of Medicine, Hippocrates, and others, in support of his doctrine; but, it is to be hoped, an obsequious regard to ancient authorities will not direct the conduct of physicians in the nineteenth century. It is high time for practitioners in medicine to acquire an independency of opinion, and to exercise their own judgment on existing facts.

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Mr. White tells us, "It is not probable that the catamenia are caused by a general plethora; but even if this were allowed, it would not from thence follow, that it is the certain attendant of the pregnant state: for if we consider the large quantity of blood which must necessarily *go towards the support of the child*, and the nausea, vomiting, and almost total loss of appetite, which are the frequent concomitants of pregnancy in its early state, it will appear, that if a plethora did at the very first exist, it must, in many constitutions, have a very short duration. I have known several ladies of delicate, tender, weak constitutions, with bad appetites, who never went their full times when they were bled during pregnancy, and as constantly became the mothers of healthy children when that operation was omitted; so that the maxim of Hippocrates, that venesection in *a pregnant woman will produce a miscarriage, especially if she be far gone*, although by much too general, appears not so ill founded as has been lately supposed; especially if we consider the relaxed constitutions in the warm climate where he lived.

"Dr. Lobb, in treating of the *danger of abortion*, has some useful and ingenious observations on this subject. He computes the monthly discharge of women at *five*, *six* or *seven* ounces at a medium. Supposing it seven, the total quantity in ten lunar months amounts to *seventy ounces*, or *four pounds six ounces*. But the weight of a child, with its placenta or membranes, is greatly superior to this; for, in an instance which he adduces, that of the child was *sixteen pounds seven ounces*, and that of the placenta *one pound four ounces*. As all this quantity of matter must first have existed in the mother's arterial system, he concludes that, during pregnancy, there must be a continual diminution of the quantity of blood; and, instead of danger from a plethora, that a woman will never be in so much want of blood in any period of her life. This appears, also, from the thinness of the face and *body* during that period. Hence he infers the danger from bleeding of causing an abortion, by diminishing the vital strength of the mother, and depriving the child of its due nourishment. He observes, *from fact*, that young women who have their full quantity of blood, *their flesh firm*, their bodies strong and agile, and inured to exercise, scarcely ever suffer abortion, except from some violent occasion; whereas, they are most subject to miscarry who are of a tender constitution, have lax muscles, a feeble pulse, and too little blood."

After giving Mr. White's opinions, with his authorities, in his own language, I shall reply to them in detailed order.

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1. It is immaterial to the present question, whether the catamenia be occasioned by a general plethora or not. If a given quantity of the sanguiferous fluid be ordinarily discharged by essential laws, and retained in the pregnant state, the consequences are the same. It, however, is essential to the present controversy, to determine the nature of plethora, that the mere sound of terms may not mislead us. We shall therefore define *plethora* to consist in an inordinate quantity of blood, or in the quantity being excessive in proportion to the tone of the solids, whether from a preternatural quantity of the former, or defective state of the latter.

The ingenious and established doctrines of Dr. Rush, in defence of blood-letting in asthenic plethora, or oppressed states of action from a relaxed condition of the system, preclude the necessity of minute discussion on this subject. The immediate effects of bleeding, in relieving the distressed symptoms of ascites and hydrothorax—in equilibriating the circulation and favouring the action of stimulants in various states of debility—in releasing the brain from the depressing effects of concussion or suffusion—and in the restoration of the pulse, from being slow, depressed and labouring—conspire to establish the utility of a careful employment of the lancet, in the irritable stages of pregnancy.

2. The support of the fœtus.—The "quantity of blood which must necessarily go towards the support of the child," should be considered as so much retained from customary evacuations, and determined to the uterus, promoting morbid excitement in that viscus.

When women are constitutionally subject to a discharge of *seventy ounces*, or, agreeably to Blumenbach's computation, of from *five* to *ten pounds* of blood, in ten lunar months, it is unreasonable to suppose, that the retention and accumulation of this quantity of matter* within the system should not produce oppression and congestion in those parts contiguous to the uterus.

The pressure of the gravid uterus on the parietes of the abdomen, in destroying the texture of the integuments, and furrowing the cellular membrane during life, are such evidences of mechanical distention, that we cannot suppose the abdominal viscera to be slightly burthened by impregnation.

* The weight of a full grown fœtus, and its appendages, so far exceeds the ordinary sum of the catamenia in ten lunar months, that other excretions must be lessened in a considerable degree. Sanctorius tells us, that five-eighths of the aliment taken into the system pass off by insensible perspiration.

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3. "That a woman will never be in so much want of blood, in any period of her life," as during pregnancy, is really paradoxical. It reminds me of Dr. Garth's allegory of dropsy—

> "Like a miser, in excess she's poor,
> And pines for thirst amidst her watery store."

4. "That venesection in a pregnant woman will produce a miscarriage, especially if she be far gone," is certainly inconsistent with modern experience, and equally repugnant to sound reasoning. In the latter months of pregnancy women are incapacitated for exercise—the appetite is usually good, and the several excretions lessened. Dr. Alexander Hamilton, of Edinburgh, whose authority in midwifery is inferior to none, thinks it at least probable that a larger proportion of blood than usual is prepared from the same quantity of food during the latter months; and when we take into consideration the heterogeneous nature of the circulating blood, and the numerous excretions which are lessened by want of exercise, while the accumulating aid of indulgence in eating and drinking is superadded to them, and also the pressure of the distended uterus contracting the volume of the blood-vessels in the adjacent viscera, I must still contend for this being the plethoric stage of pregnancy.

Mr. White's declaration, that he has known several ladies, of delicate, tender, weak constitutions, with bad appetites, who never went to their full times when they were bled during pregnancy, and as constantly became the mothers of healthy children when that operation was omitted, is only to be opposed by the warranted avowal of different experience, which I make with equal confidence and sincerity. And I am constrained to believe, that the evils resulting from this "*operation*" may justly be imputed to its abuse in point of time or quantity. I have known the loss of a pint of blood, in a delicate pregnant woman, induce premature labour, when from four to eight ounces would have had a different effect.

Some women, who have received benefit from blood-letting in previous pregnancies, or whose feelings dictate its present use, will, to avoid the delicate task of conversing with a physician, employ some mechanical operator, and enjoin him to take a large quantity at once, that it may not require repetition. The consequences are often such as every reflecting physician would anticipate.

The frequent occurrence of convulsions in the last month of gestation, and the relief afforded by bleeding, is counter testi-

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gnomy to the experience of these gentlemen. In a case of autumnal fever, in 1801, in a lady of a florid complexion, but effeminate habit, with tolerably tranquil pulse, I deferred bleeding at the request of her friends, and in the after-part of the same day she was attacked with violent convulsions. I now repented of my ill-judged complaisance, and immediately drew six ounces of blood from the arm, when her pulse, from being labouring and depressed, became full, regular and flowing; and, in obedience to these monitors of restored arterial excitement, I contented myself with the small evacuation of six ounces of the offending fluid at that time.

In a few hours her pulse became tense, with excessive vascular action, and the loss of twelve ounces more reduced it to a regular, equable state. The exacerbation of the night was attended with convulsions, but the additional evacuation of ten ounces transformed her fever into a mild remittent of short duration, without injury to the child.

The states of the pulse, in these mixed forms of disease, require great attention. The labouring throb of convulsive action must first be reduced to an equable fulness, and afterwards prevented from running into the more simple, but still morbid state of tension and quickness.

A second case of convulsions presented itself in February last. The first affection was a paralysis of the right arm in thirty-six hours, attended with violent and general convulsions. When called, I found her pulse hard and depressed, and proposed bleeding. Her friends objected, from the apprehension of its injuring the child; but, taught by previous experience, to be responsible to my own judgment, where I am the only professional attendant, I drew eight ounces of blood, when her pulse rose; and a few hours afterwards drew twelve ounces more. The consequence was, the next day my patient left her bed, and her relations confessed the unexpected advantages of blood-letting in pregnancy. In a few days she had a comparatively easy labour, and now nurses a healthy child.

5. "That young women who have their full quantity of blood, their flesh firm, their bodies strong and agile, and *inured to exercise*, scarcely ever suffer abortion, &c. whereas, they are most subject to miscarry who are of a tender constitution, have lax muscles, a feeble pulse, and too little blood." Here I agree with Dr. Lobb, and "*from fact*" too. Young and vigorous women are certainly much less liable to suffer from the mechanical effects of pregnancy than those of ten-

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der constitutions. It should also be observed, that the former have regular and moderate menstruation, compared with the latter. Weakly women sometimes menstruate every two or three weeks, and often to excess. The relaxed state of their solids cannot restrain the topical congestion of the uterine vessels, or check the hæmorrhagy when it has taken place. They therefore suffer a much greater change of condition, by impregnation, than their vigorous and healthy competitors for maternal happiness.

It is also worthy of remark, that "women of tender constitutions and relaxed muscles" have comparatively easy labours. Little resistance exists to the contractions and projectile force of the uterus; whereas, women of firm solids frequently suffer beyond all description. And, it is justly observed by Dr. Rush, in his "defence of blood-letting," that direct debility, whether induced by fasting or long and slow diseases, tends alike to mitigate the pains of labour; that he has often observed labours to be short, and comparatively easy, which have succeeded a fever that has been cured by bleeding; and that Dr. Dewees informed him he had often bled when parturition was slow, and that he had always found that he thereby both shortened and lessened the pains of labour.

There are many instances of labour being extended for several days, in women married late in life, owing to a rigid state of the system, and the final birth of the child protracted to the occurrence of indirect debility in the mother. Hence we frequently succeed, in cases naturally desperate, when the nearly exhausted patient is about to sink into a puerperal grave. But how much more safe, easy and expeditious it is, to induce direct debility by blood-letting, and preserve the powers of the system, at the trifling and necessary expense of a few ounces of sanguiferous fluid. The alternative needs not reflection.

An observance of the old maxim, that "an ounce of prevention is worth a pound of cure," will not only relieve the distresses of pregnancy, but lessen the sufferings of parturition, in a surprizing degree. Pain is not the only distressing attendant of labour: oppression at the breast, impeded respiration, spasmodic affections of the bowels and lower extremities, hysteria, head-ach, and sometimes convulsions, claim a place in the list of concomitants; and timely evacuations will alone prevent or remove those evils.

With regard to the general management of women with child, says Dr. John Clark,* we ought always to remember,

* Practical Essays, &c.

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that the progress of the future labour, and its consequences, will depend very much upon the previous state of the patient's health. In every thing, therefore, which we recommend to pregnant women, we should consider the effect which may be thereby produced upon the labour, and upon the health of the woman afterwards.

He then proceeds in his directions on the management of pregnant women, considering the natural disposition of this state as verging towards plethora, and *diseases of increased action.* His recommendation of abstinence and evacuations is earnest and impressive, especially in affections of the chest, so that our pregnant patient may fall into labour in perfect health. But, agreeably to the position of pregnancy being a diseased state, we must renounce the expectation of procuring health before delivery, and endeavour to conduct our female friends into parturition in as simple a state of disease as possible; with the opposing powers of the system nicely balanced—the thoracic viscera prepared to sustain the pressure of the encroaching uterus—and the associating functions of child-birth fitted to co-operate in the ultimate office of delivery; which is all that can be expected from previous medical aid.

Dr. Rush, in his happy method of extenuating the ills of human life, observes, that pain is probably not necessarily connected with child-bearing; and that many of the other evils inflicted upon the human race, in consequence of the disobedience of our first parents, have been lessened or eradicated by the ingenuity of man.

I now submit the inquiry into the utility of occasional blood-letting in pregnancy, on this concise view of the subject, to my professional brethren, with due deference to the opinions of those who confine the operation to the more urgent complaints of utero-gestation, requesting an unprejudiced consideration of the following corollaries.

1. The catamenia is a constitutional hæmorrhagy, immediately formed by topical congestion, and preparatory to impregnation.

2. The frequency and quantity of the catamenia depend also on the state of the solids, and are abundant in relaxed habits.

3. The general change of condition consequent to pregnancy is greater in feeble than vigorous constitutions.

4. The necessary disposition of pregnancy is towards plethora, or a progressively diseased state, with morbid uterine excitement.

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5. Women of delicate or relaxed habits are most susceptible of disorder from incidental irregularities, and require special attention.

6. Many of the present complaints of pregnancy are to be imputed to the influence of refined modes and manners in producing effeminacy.

7. Effeminacy is the secondary cause of most of the concomitant ills of pregnancy.

8. Abortion, hysteria, &c. occur most frequently in feeble and delicate women.

9. The hazardous complaints of pregnancy are owing to irregular excitement, or oppressed states of vascular action.

10. The restoration of a due balance of force between the opposing powers of the system is the only safe and certain method of relief.

11. Cautious, but not fearful, blood-letting obviates the natural disposition of pregnancy to plethora, preventing a disarrangement of the vascular system, or removing it when formed.

12. Bleeding is more frequently and essentially necessary in women "of tender constitutions," than in those possessing full strength, and inured to exercise.

13. The dangers of blood-letting are to be sought for in the *abuse*, and not in the careful use of the operation.

14. Most of the objections to blood-letting in pregnancy are predicated on the supposed diminution of the aggregate exciting powers of vascular action, without regard to the perpetually augmenting influence of the distended uterus.

15. Instead of a woman suffering depletion by impregnation, several pounds of fluid are retained, and transformed into fœtal organization.

16. So far from a woman never being "in so much want of blood, in any period of her life," as during pregnancy, she never is so much burthened with a plethoric disposition, and never bears repeated blood-lettings with so much safety and advantage as in this diseased state.

Lastly. Agreeably to the position of pregnancy being a diseased state, consisting of morbid excitement in the uterus, the efficacy of judicious blood-letting, in obviating and relieving most of the incidental complaints of pregnancy—in removing habits of abortion and premature parturition, and in facilitating mature labour, will, I flatter myself, be admitted by every impartial inquirer.

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ARTICLE VI.

Observations on the Conversion of Iron into Steel; In a Letter from the Rev. Joseph Priestley, *LL. D. to the Editors.*

ACCORDING to the antiphlogistic theory, iron becomes steel by imbibing *carbone*. To this is said to be owing the addition to its *weight* in the process of cementation; and the black flakes which remain undissolved after the solution of steel in diluted vitriolic acid, is said to be *plumbago*, or carbone united to iron.

I cannot, however, help concluding, from some late experiments, that iron is converted into steel by imbibing only phlogiston from the charcoal with which it is cemented, and that the addition to its weight is not from *carbone*, but from *finery cinder*.

Having made a quantity of iron filings perfectly pure, by first expelling from them all the air that they would yield by heat, then washing out any carbonaceous matter that might be contained in them, and again exposing them to heat, I took 120 grains of them, and, heating them with a burning lens in inflammable air, they imbibed eighteen ounce-measures of it.

In consequence of this, from being of a dark colour, they became exceedingly bright, and I concluded that they had now become steel, though I could not prove it by any decisive experiment. But, after dissolving them in diluted vitriolic acid, a quantity of black matter, as from the solution of steel, remained unaffected by it. This being heated in inflammable air, imbibed a considerable quantity of it; and then, by means of diluted vitriolic acid, it gave inflammable air very copiously. This black matter, therefore, had evidently the properties of finery cinder.

I then dissolved 200 grains of broken *watch-springs*, which are undoubtedly pure steel, and collected from the solution three grains of black matter. Heating this in inflammable air, it imbibed a great proportion of it, and then, by means of the diluted acid, it gave inflammable air as copiously as iron or steel filings would have done. This black matter, therefore, was finery cinder, and not carbone or plumbago; and, as iron acquires weight by becoming finery cinder, and this weight I think I have proved to come from its absorption of *water*, it can hardly be doubted but that this addition of

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weight to iron, in becoming steel, is from the same cause. Indeed, I believe it to be impossible to expose iron to a red heat in circumstances in which there is any possible access of water, or of air which always contains water, without a partial calcination of it, that is, its becoming, superficially at least, finery cinder.

This was evidently the difference between the solution of the watch-springs, and that of an equal weight (viz. 200 grains) of broken *polished needles*, which had not undergone any calcination: for the black matter that remained from the solution of them would not have weighed a quarter of a grain. Giving colour to steel (which is done to the watch-springs) is always a partial calcination of it, and this appears, from the preceding experiments, to be a conversion of part of the metal into finery cinder, which is the reverse of plumbago, being, according to the new theory, an *oxyd* in the highest possible degree; whereas, if plumbago contain any oxygen, it is in the lowest degree.

ARTICLE VII.

FACTS *to show that both* SEPTIC ACID *and* VOLATILE ALKALI *are formed during the* PUTREFACTIVE PROCESS: *In a Letter to Dr.* MITCHILL, *from Mr.* ISAAC BRIGGS, *dated Sharon (Maryland), 5th of 8th Month (August),* 1802.

MY FRIEND,

ON attentively perusing thy papers, and those of thy correspondents, on the subject of an acid gas produced in putrefaction, and of its pestilential effects, the reasonableness of the theory gained my assent. But, deeming it unphilosophical *implicitly* to adopt any theory, I was induced to try, to the extent of my limited circumstances, and small stock of chemical knowledge, its applicability as a solution of those phenomena of nature which came under my observation. In the course of this investigation I acquired some new ideas, which I now respectfully submit to thy examination.

In the first place I will simply state a few facts, and then offer, as the best solution which has yet occurred to my mind, some remarks. If they furnish, to the learned chemists of the present day, matter for reflection and experiment, so as to

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cause the developement of one useful truth, or the elucidation of one mysterious operation of nature, resulting in the augmentation of a knowledge which may increase the comforts, or tend to preserve the health of man, my object in offering them will be accomplished. If truth be but discovered, it will be of small importance to me whether it be found in the establishment or in the refutation of my opinion. Even in the latter case, if I can provoke inquiry, I shall console myself with the belief, that I have cast my mite into the treasury of useful science.

Having failed to get my manure out upon my fields in the spring of last year, it lay in a considerable mass, during the whole summer following, in my barn-yard, which is situated on a declivity facing the south-east, and is bounded, on its lowermost margin, by a bank of earth, for the purpose of preventing the loss of the soluble parts of the manure by rains and thaws. Above this bank, and contiguous to the main body of manure, which was several feet in thickness, stood a considerable pond of water throughout the summer. Besides the vegetable and excrementitious animal matter of which the manure was composed, there were buried in it the carcases of three small hogs. Two of them were buried by a servant, carelessly, and not more than twelve inches beneath the surface. A few days afterwards (the weather being very warm) a cloud of dense vapour was seen, each morning, hovering over the spots where these carcases were deposited, and the cadaverous smell became intolerably offensive to a considerable distance. I then had about half a bushel of dry, air-slaked lime spread over each grave. The vapour was soon repressed, so as to be scarcely visible; the fœtid effluvium was reduced to a very small space, and, even over the very spot, so attenuated as to be supportable. The third carcase was deposited in the manure-heap, about ten inches deep, in a situation the most favourable for putrefaction: the bottom and sides of this grave were lined with lime, the carcase covered with it, and manure thrown over the whole to the thickness of three or four inches. In this case also the quantity of lime was about half a bushel. I never discovered that the atmosphere received the least taint from this carcase.

It was my practice to mow weeds, and to throw them into the edge of the pond.

During the ninth month of last year (September) the weather being uncommonly hot, the appearances of the water of this pond were curious, and to me interesting. Its whole surface

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was covered with a scum, which, as the day advanced, gradually exhibited the different shades of colour, from a dirty green in the morning, to a tint as red as blood, which continued during the hottest part of the day. In the afternoon, as the heat declined, there was a progression of shades from this blood-red to a yellowish green in the evening.

These phenomena were daily repeated during the hot weather. Whether they have been noted before by others I know not; but to all my acquaintance who viewed them, as well as to myself, they were entirely new.

I consider the red colour, incumbent upon the water, as a strong indication of the presence of an *acid*, and the green colour as equally indicative of the presence of an *alkali*. The weeds thrown into the pond, I suppose, furnished a colouring matter, possessing, in some degree, the properties of litmus.

In the putrefactive process, it appears to me probable that both an acid and an alkali are produced, at least where much water is present; the water being decomposed, its oxygen combines with a part of the septon, forming septic acid, and its hydrogen with another part of the septon, forming ammonia.

The opinion that ammonia is formed in spontaneous putrefaction is not new; but most chemists, I believe, fixing their attention upon this, have too much overlooked the production, from the same source, of the active, volatile *acid*, which, like a true leaven, is the *parent* as well as the *offspring* of corruption. This valuable discovery was reserved for thee. I believe it is founded in truth; but I see not that we are hence under any necessity of denying the production also of volatile alkali.

It is my opinion that both volatile septic acid and ammonia are produced in spontaneous animal decomposition: and from this hypothesis I infer, that whenever the acid and alkali are produced in such proportion as just to saturate each other, septite of ammonia is formed, and no mischief ensues; that whenever the alkali is in excess, its action, if not salutiferous, is at least innocent; but that whenever the acid is produced in greater quantity than the alkali can neutralize, its superabundant part, left free, is probably wafted about, loading with morbific miasmata the wings of every breeze.

The following question is often triumphantly proposed by the advocates of *imported* pestilence and specific contagion:— "If," say they, "a something, proceeding from the putrefaction of animal and vegetable substances, be the parent of malignant fever, and if the same cause uniformly produce the

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same effect, why are our cities *sometimes* desolated by yellow fever, and not always so, when they contain masses of putrefying substances equally great and numerous? Nay, why is there often *no diminution* of usual health, when this supposed cause apparently exists in full force?" Then taking it for granted that this question cannot be answered, nor their other objections* surmounted, consistently with the theory of domestic origin of pestilence, it is pronounced "frivolous, inadequate and groundless."

If both septic acid and ammonia be produced in the process of putrefaction, many adventitious circumstances, the tendency and measure of whose agency we have not yet ascertained, may vary the result, as to the predominance of one or the other of those volatile products, so as, in my opinion, to account for this apparent variance of cause and effect: for instance, different degrees of heat may vary the facility of the disengagement of septon, and may cause its oxygenation as well as hydrogenation in different degrees. Hence may result innumerable differences, both in quantity and quality, in the acid and alkaline products, with very different appetences for each other, and for surrounding substances. Different proportions, also, of water may greatly augment the variety.

This subject may receive much light from experiments judiciously and candidly conducted, and from observation of, and deductions from, the phenomena of nature, made by those whose love of truth is simple—free from bias, in favour of, or against, any particular theory or political interest.

For my opinion that the products of putrefaction are both acid and alkaline, and subject to great variety, I solicit no favour, except so far as it may have truth for its basis.

As water seems to be the principal substance from which hydrogen is derived in any considerable degree, and as this is essential to the formation of ammonia, it follows, that the

* I cannot think that the theory of domestic origin of pestilence has ever been fairly refuted from the laboratory of the chemist. Although much has been said of Beddoes and Davy, in England, with *nitrous oxyd*; and although Dr. Currie, of Philadelphia, seems so confidently to rely on "a collection of facts and observations" respecting "nitrous air" and "nitrous acid," "by George Lee, a medical student in the Pennsylvania Hospital;" yet I must take the liberty of receiving with caution their conclusions, until they prove the *identity* of *their* nitrous acid air, and *nature*'s volatile septic acid. The former, I believe, is always derived from its combination with an alkali; the latter immediately from putrefaction. Until they prove that the original septic acid receives no modification from its combination with an alkali, nor from their process in obtaining it, I cannot admit their analogy as conclusive.

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quantity of water present, in a moist atmosphere or otherwise, has a primary influence on the pestilential effect of putrefaction. I wish the *hygrometer*, as well as the thermometer, may be generally used and accurately noted on these occasions.

I have made several experiments, in which I think I have plainly detected ammonia, mostly in combination with an acid, in the results of spontaneous putrefaction. These experiments, together with additional ones, may be the subjects of future communication, if the present be worthy of notice.

I am, respectfully, thy friend,

ISAAC BRIGGS.

ARTICLE VIII.

OBSERVATIONS *on* SCARLATINA CYNANCHICA; *by* FELIX PASCALIS, *M.D. in a Letter to the Editors, dated Philadelphia, Feb.* 8, 1802.

WE have been visited during the last winter month, by the *Scarlatina Anginosa*, or *Cynanchica* (scarlet sore-throat). This epidemic, I suppose, originates, like all others, in certain specific and deleterious principles of the air, or of our aliment. But whenever it is formed, it is either aggravated by acting and re-acting circumstances, or, if it is counteracted by the predisposing habit of the patient, it unexpectedly proves a very mild complaint. Thus we had two distinct species of the scarlatina cynanchica. Neither prevailed universally; and the worst kind seemed to affect children from the cradle to the age of twelve years. Few adults, except those who were foreigners, have fallen victims to this disease.

Epidemics of rare and distant occurrence are very embarrassing in medical practice. Some time elapses before we have collected all written documents, and recollected our own observations; and if there are but few or confused precepts on their treatment, we cannot place an absolute confidence in our best applications.

In many respects our scarlatina anginosa was similar to that which Fothergill investigated in London, during the years 1747 and 1748, and which, a century before, had pervaded almost all the southern countries of Europe. Withering has still better described the symptoms of the scarlatina, as it prevailed at Birmingham in 1778; so that the disease cannot be

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mistaken for the malignant or putrid sore-throat, *morbus strangulatorius, suffocativus*, &c. We have likewise a very true description of it by Sauvages, as it raged in Montpellier in 1765. The same I have seen frequently in the most southern parts of France.

Whether this disease is always a concomitant of others, such as the small-pox, measles, and cynanche tonsillaris and trachealis, we have not sufficient authority to affirm: thus much, however, may be said, that it appeared with the measles at Birmingham, and in Philadelphia, where the latter epidemic has not yet subsided, since the beginning of the summer.

Our scarlatina cynanchica was preceded by a few days of stupor and unusual weariness, with a slight painful sensation in the throat, and sometimes in the neck and back part of the head. Children who could speak complained of an alternating chilliness and flushing heat, head-ach and sickness. In this stage of the disease, many of the worst cases were marked with delirium, convulsive motions of the muscles of the face, and grinding of the teeth. On the second and third day the soreness of the throat had so much increased that deglutition was very painful; yet the tonsils and salivary glands were little enlarged; but the tongue, velum palati, and fauces, were uncommonly red. Already the face and neck appeared flushed; and, from the breast down to the pubes, a florid redness seemed to be produced by innumerable small pimples and pustules. This eruption sometimes extended to the lower extremities, and over the shoulders and the hips.

Convulsions and delirium in some cases, and great restlessness in others, were observed; and every symptom changed according to the impending issue of the case. If fatal, on the fourth day the scarlet eruption abated, the belly swelled, the skin became rough and dry, and the redness of the cheeks and lips gave place to a livid paleness of the face. The patient experienced an uncommon thirst, without ever swallowing but a few drops; his mouth became parched, and his pulse was small, quick and feeble. The breath was offensive, respiration tremulous and accelerated; and, at last, any kind of medicine would induce a colliquative diarrhœa. In a few hours death ensued, marking the surface of the body with a dark brown ecchymosis. But on the fourth day the case might take a far different and more favourable aspect: the scarlet eruption might change into a brownish colour, some moisture be perceived on the skin, and the submaxillary glands become

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more tumefied. Although the pain of the throat and the difficulty of deglutition were augmented, and the tongue seemed covered with a black or yellow crust, still a favourable discharge of purulent matter was effected from the nose and mouth. Branny scales were discovered on every part of the body, and gangrenous sloughs were discharged from the fauces.

I have not seen, in this stage, the same external effects of mortification, or of hæmorrhage from the ears, &c. as many writers relate; but I believe parts were frequently spotted, and a few gangrenous sloughs detached from them. Notwithstanding, the bowels were regular, and obedient to operations; the urine appeared natural, and the pulse equal, although quick and febrile. In short, in this stage, the scarlatina cynanchica existed no more, except by its effects; the case was merely a typhoid disease, with more or less of those accidents, which were to be referred either to the identity of the attack, or to the age of the patient.

Dissection has, as yet, afforded but little elucidation as to the nature of this disease. Withering mentions one only of Sennertus, who found great ravages in the lungs and the liver. But these, I have reason to believe, cannot be ascribed to the scarlet fever; they must have been the result of some previous complaint. A boy of eleven years old was, on the fourth day, carried off, with the most severe symptoms of the epidemic. Permission of opening the body having been obtained, no alteration was discovered in the lungs nor in the liver. The trachea and the stomach were likewise in a very sound state. The fauces, it is true, the glottis and tonsils, were remarkably livid. But, on the other hand, the large intestines were mostly mortified, and all the glands of the mesentery were considerably enlarged and indurated. In this case also I am prevented from drawing any positive conclusion, for the child was supposed to have been previously labouring under some consumptive disorder.

I have heard many eminent physicians describe two very different degrees of the scarlatina cynanchica. Thus, while natural exertions will be sufficient for the management of a mild case, we may be at a loss to fix upon the best mode of treating the gangrenous scarlatina. Medical writers have rather increased our perplexity on this subject, by informing us that certain remedies have either failed or succeeded, when they have neglected to form indications to rule the practice and exhibition of medicines. The prolix treatise of Withering de-

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termines nothing but a preference in favour of emetics and diuretics. Can it be conceived, however, that, in an inflammatory and malignant disease, any remedy, such as bleeding, purging, sweating, tonics, acids, opium, blisters and bathing, could all and severally prove abortive, or contrary to necessary indications?

Judging from our experience with Dr. Withering's favourite resource of emetics, we find that they answer very well in the beginning of the disease, to discharge the contents of the stomach, to dispel the impending influx of fluids in the fauces, and to keep up the scarlet eruption on the skin until its desquamation is produced. But this first period of the disease is short; and the more intense it is, the greater is the danger of promoting, even with mild medicines, an inverted operation, when a fatal diarrhœa will soon put an end to the struggle and the life—*quæque miserrime vidi.*

As for his diuretic (fixed vegetable alkali), it afforded relief if given as a *citrate of pot-ash.* It promoted salutary discharges, but its operation did not concur with the principal indications of the treatment; and hence I may show the efficacy of many of the remedies rejected by, or unknown to Dr. Withering.

Three things are striking when the scarlet cynanche has favourably passed the periods of invasion and *maturation.* These are, 1st. The efflorescence or desquamation on the skin; 2dly. The suppuration or discharges of the mouth, nose and ears; 3dly. The gangrenous sloughs from the fauces, or the gangrenous spots, abscesses, vibices, &c. on any part of the body. Of whatever nature the poison or virus of the disease may be, it is surely requisite to aid its dispersion in the most natural manner; viz. the scarlet desquamation should be carefully promoted; the suppuration in the fauces should be accelerated; and the gangrenous tendency in the system should always be counteracted.

In the first instance one or two emetic and diaphoretic remedies will prove highly beneficial; but how much more effectually the second end will be answered by calomel, is evinced by the happy concurrence of many facts. A dose of four or five grains, with an equal quantity of camphor, mixed with some jelly, may be repeated every three or four hours, and seldom continued longer than three or four days, when the purulent discharges from the mouth will be sufficiently promoted, and when bark, wine, opium, and even alcoholic mixtures, will effectually oppose the gangrenous tendency.

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If we attend to several circumstances, throughout the different stages of the disease, it will appear obvious that its invasion and action must accumulate such excitement, that bleeding and warm bathing ought sometimes to be resorted to for the relief of convulsive and inflammatory symptoms. But, after the desquamation and discharges of the mouth have taken place, as the disease is transformed into a typhoid affection, in which a direct debility is induced, it will demand the use of all stimulating remedies, among which blisters are particularly successful.

The exhibition of mercury in scarlatina cynanchica, assisted by a medical process, according to the above-mentioned intentions, has never been unsuccessful, as far as I employed it, in a few cases of the most intense malignancy. Yet much benefit is to be ascribed to calomel, according to the recommendation long ago given to it by Dr. Samuel Bard, of New-York, in his essay on the sore-throat, or *Morbus Suffocativus*,* and which, perhaps, differed but little from our epidemic. Had I no other authority, I must acknowledge that I should have been sufficiently encouraged by Dr. Rush, in one of those remarkable cases in which the organical powers were so much prostrated and injured that life was despaired of.

P. S. In the Medical Repository, vol. v. p. 89, a case is related of the tape-worm being effectually discharged by using the decoction of Fern.

Is not this plant the *Polypodium Filix Mas* of Linn. class *Cryptogamia*, called *La Fougere* by the French?

Does not its pulverized root constitute the famous remedy of Mrs. Nouffer, of Switzerland, against the tænia or tape-worm?

Did not Lewis XVI. King of France, order the remedy to be bought, and published, as it is, in many books, and especially in the Pharmacy of Beaumé?

Was the gentleman who used it unacquainted with this form of the remedy before he prescribed the decoction, or did he not rely upon the method of exhibiting the root itself in powder? If so, I take the liberty to inform him that I was once present at the operation of two drams of the said powder, which, in twenty minutes, expelled from the body of a Russian Captain as many feet of a tape-worm as to fill up a quart bottle! F. P.

* Vide American Philosophical Transactions, vol. i.

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REVIEW.

ART. I. *Memoir on the Supply and Application of the Blow-Pipe. Containing an Account of a new Method of supplying the Blow-Pipe, either with Common Air or Oxygen Gas; and also of the Effects of the intense Heat produced by the Combustion of the Hydrogen and Oxygen Gases. Illustrated by Engravings. Published by Order of the Chemical Society of Philadelphia; to whom it was presented, by* Robert Hare, *jun. Corresponding Member of the Society.* 8vo. pp. 34. *Philadelphia.* Maxwell. 1802.

HOW long a time elapsed, after the creation of man, before he became acquainted with the use and management of fire, is not precisely known. An agent so conducive to his wants would, in all probability, be soon discovered, and enlisted in his service. This is so generally the fact, that we are almost inclined to doubt the relations of those early navigators who have told us that the inhabitants of the Canary and Landrone Islands were ignorant of the use of fire, and expressed great astonishment when they first beheld fuel in a blaze. The most rude and untutored nations know how to kindle and excite it by friction or collision: and the volcano and lightning furnish it without the aid of human hands.

The surface of the earth abounds with inflammable materials. Whether fire was communicated to these by art or by nature, it must have been soon discovered that a gentle motion of the atmosphere would brighten and spread it, or would even kindle it into a flame. The distinction between fire in the form of a *steady coal*, and of a *wavering flame*, was soon attended to. All knew that, in the former, its progress was slow, its heat moderate, and that it was very apt to become extinct; while, in the latter, the production of blaze was the immediate cause of augmented heat, of greater rapidity in the spread of it, and of augmented strength in decomposing the substance which afforded it. Thus untutored man, or man tutored only by the plainest lessons of practice, learned that, in kindling a fire, the great object of solicitude was "the blaze."

To accomplish this desirable end, various expedients were tried. The discoveries of *tinder* and of *punk*, to receive a

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spark, and to preserve it from extinction, were of high importance: but their advantages were limited. Though they and certain other *carbonic* substances would retain fire for a long time, they were unable to communicate and diffuse its activity, with the requisite speed, around. Something else was necessary: and it soon appeared that there were numberless substances which possessed the double property of burning *without flame* in a low temperature, and of *exhibiting that brilliant phenomenon*, if the heat was sufficiently increased. Bodies possessing this *two-fold* character were so abundant, that the enumeration of them would be, with perhaps a dozen exceptions, scarcely less than a catalogue of all animal, vegetable, and mineral inflammables.

Thus the strong and characteristic difference between "ignited coal" and "ignited vapour" very soon arrested the attention of man. He knew, that to have a powerful and diffusive fire, he must have "ignited vapour:" and he employed himself, from time to time, in devising the means of procuring it. His first essays were probably no more than imitations of the breeze which brushed through his little pile of dry and kindling sticks. He put the air in motion by winnowing or fanning; and a broad leaf, a fragment of bark, or a bunch of feathers, might have rudely answered the purpose. By such aids, the phlogiston might have been more expeditiously separated from its carbonic associate, and have gratified him as it ascended on wings of flame toward the skies.

It was very natural to apply the breath of his mouth to assist in the ignition of coal, and the burning of phlogistic gas. A full inspiration of common air, driven through the half-contracted lips by the force of the muscles which the will brought into action for the purpose, was found to be very serviceable in exciting flame. The stream might be weak or strong, scanty or copious, as the operator pleased; and whether he blew the coals gently, or urged them with a full blast, he may be said, as he inclined toward the fire on his hands and knees, to have first brought into action the principle "of the bellows."

But he soon found inconveniences in this mode of kindling his fire; for, by too near an approach, his face was often scorched by the heat, his eyes dazzled by the light, and throat and nostrils irritated by the smoke. He, however, soon satisfied himself that nearly the same purpose might be answered, if, standing at a short distance, he could apply the force of his *pulmonic bellows* to act upon the fuel through the medium of

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a hollow cane or tube. A straw, a reed, or the pithless stem of a burdock or a parsnip, afforded such a vehicle for the transmission of his breath. And as he adapted his lips to this *pipe*, and *blew* through it, he made the original experiment on the *blow-pipe*.

Art travels fast in the foot-steps of nature. In process of time, a machine was contrived upon the principle of the human lungs and their auxiliary reed. By an apt shape and disposition of certain pieces of leather, wood and iron, an instrument was constructed with a valve, to admit atmospheric air at one opening, and to expel it at another. To this other aperture a metallic pipe of a conical figure was adapted. In short, *the artificial kindling or culinary bellows, with its projecting nozzle*, was invented.

This piece of apparatus enlarged the dominion of man very materially, by giving him greater command of fire. By erecting bellows of various sizes and powers, he has been enabled to excite higher heat in his forges and furnaces than could be otherwise accomplished. And great dispatch and economy in some of the most useful arts, to wit, those in which processes upon the metals and earths are performed, have been the beneficial consequences.

Although so much was done, something more was wanted. In the nicer operations upon metals, such as soldering, enamelling, &c. the artists wished for an intense heat, that could be directed to *one* spot, and that a very *small* one. For succeeding the better in these delicate works, the gold and silversmiths neglected the *culinary* bellows, went back to the blow-pipe, and sought the means of employing it more advantageously in connection with the lips and the *pulmonic* bellows. By a little skill in the construction and employment of it, these tradesmen found that it was applicable to many useful purposes, and could melt metals. And they also discovered that *inflammable air*, or *the blaze of a large lamp*, afforded a more convenient and powerful heat than charcoal, or any thing else they were acquainted with.

As trades grew to sciences, and as artists turned to philosophers, this blow-pipe was introduced into the laboratories of the chemists. They likewise blew the blaze of their lamps against the body to be operated upon. So much were they pleased with its effects, that the great BERGMAN made the blow-pipe (tubus ferruminatorius) the subject of an elaborate essay. As, however, there were difficulties incidental to using it with the mouth, a bellows with a pedal was invented to fa-

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your the lungs, to leave the hand at liberty, and to employ the foot. A particular account of this, with a plate, was subjoined to the second volume of Magellan's edition of Cronstedt's Mineralogy.

In all these experiments, the fluid driven upon the burning or flaming body was atmospheric air. From the beginning, the *burning* body was ordinarily phlogiston. And what is extraordinary almost beyond belief, though flame and its properties of exciting heat have been understood so long, philosophical men, *forgetting that blaze is but inflammable air on fire*, seem, of late, to have thought the economical employment of it was a great and modern discovery!

Mr. Hare, who appears to be a leading and active member of the Chemical Society of Philadelphia, has laboured, after the example of his predecessors, to render the blow-pipe more manageable and useful. Instead of working it by the mouth or the foot, he proposes to propel the air *by the pressure of a column of water*. This he has contrived to accomplish in a very neat, ingenious, and portable machine, which he calls "the hydrostatic blow-pipe." The greater part of the publication is devoted to the description, explanation and application of this new and improved piece of apparatus. On this we should dwell at some length, was it not impossible to give our readers any tolerable idea of it, without the machine itself, or the print which accompanies the work. This, which was drawn and engraved by Mr. James Aikin, gives a clear and satisfactory view of this useful invention. We may mention, however, that it is so contrived as to contain two kinds of air without mixing, and these may be either atmospherical air and inflammable air, or oxygenous air and inflammable air, as the operator pleases. Or he may fill it with atmospheric air alone, to act upon the inflammable air which forms the flame of a lamp. For these reasons it will be immediately apparent how preferable it is to a crucible.

It gives us much pleasure to find the members of the Chemical Society of Philadelphia so intent upon physical researches. From the author of this memoir, so favourably introduced to us by his book, we expect other works, tending to cultivate the fields of nature, and to beautify and enlarge our perspective. It is glorious that the sons of science and of liberty in America are originating and discovering more and more among themselves, and returning a full equivalent for the knowledge they derive from Europe. And it is comfortable that our exports will probably soon exceed our imports.

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We extract the following passage, which will serve at once as an example of Mr. H.'s manner of writing, and of the effects wrought by his hydrostatic blow-pipe. (p. 30.)

"I shall now describe the changes effected on the most fixed and refractory substances, by the flame of the hydrogen and oxygen gases.

"In order to avoid a tedious recurrence to an awkward phrase, I shall generally, in the subsequent part of this paper, distinguish the flame of the hydrogen and oxygen gases by the appellation of *gaseous flame.*

"By exposure to the *gaseous flame*, either on supports of silver or of carbon, barytes, alumine, and silex, were completely fused.

"The products of the fusion of alumine and silex, were substances very similar to each other, and much resembling white enamel.

"The result of the fusion of barytes, was a substance of an ash-coloured cast, which, after long exposure, sometimes exhibited brilliant yellow specks. If it be certain that barytes is an earth, these specks must have been discoloured particles of the silver support, or of the pipes from which the flame issued.

"Lime and magnesia are extremely difficult to fuse, not only because they are the most refractory substances in nature, but from the difficulty of preventing them from being blown on one side by the flame; nevertheless, in some instances, by exposure on carbon to the *gaseous flame*, small portions of these earths were converted into black vitreous masses. Possibly the black colour of these products of fusion may have been caused by iron contained in the coal; for, in the high temperature of the *gaseous flame*, a powerful attraction is reciprocally exerted by iron and the earths.

"Platina was fused by exposure on carbon, to the combustion of hydrogen gas and atmospheric air. But the fusion of this metal was rapidly accomplished by the *gaseous flame*, either when exposed to it on carbon, or upon metallic supports.

"A small quantity of this metal, in its native granular form, being strewed in a silver spoon, and passed under the *gaseous flame*, the track of the flame became marked by the conglutination of the metal: and when the heat was for some time continued on a small space, the lump of fused platina became immediately formed.

"About two penny-weight of the native grains of platina, when subjected to the *gaseous flame* on carbon, became

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quickly fused into an oblate spheroid, as fluid as mercury. This spheroid, after being cooled, was exposed as before. It became fluid in less than the fourth of a minute.

"Had I sufficient confidence in my own judgment, I should declare that gold, silver and platina, were thrown into a state of ebullition by exposure on carbon to the *gaseous flame:* for the pieces of charcoal on which they were exposed became washed or gilt with detached particles of metal, in the parts adjoining the spots where the exposure took place. Some of the particles of the metal thus detached, exhibited symptoms of oxydation.

"As the fusion of lime and magnesia, by exposure on carbon, was accomplished with great difficulty and uncertainty, it became desirable that means might be discovered of effecting this fusion with greater ease.

"By the union of the base of oxygen with iron, the whole of the caloric of this elastic fluid is supposed to be extricated. This consideration, together with some practical remarks on the heat of burning iron, induced me to employ the combustion of this metal, in conjunction with that of the hydrogen and oxygen gases.

"Some pieces of iron wire, each of about half an inch in length, were quickly thrown into fusion and rapid combustion, by exposure on carbon to the *gaseous flame.* When either lime, magnesia, barytes, alumine, or silex, were thrown on the iron in this state, they became instantly melted and incorporated with the metal. It remains a question, whether, in this case, the earths were fused or dissolved; and whether the substances which resulted from their union with the iron were mixtures or combinations. If they were combinations, according to the present nomenclature, they should be denominated *ferrurets.*

"The difficulty of igniting some substances which are only susceptible of combustion at very high degrees of heat, has hitherto excluded them from the laboratory. By means of the *gaseous flame,* such substances may be employed with the greatest facility in small analytical operations.

"Of the nature of the substances above described, are the carburets of iron, and some peculiar species of native coal.

"Among the carburets of iron, the English plumbago is esteemed the best. Some pieces of this substance, obtained from the best English black lead pencils, were readily thrown into combustion by exposure to the *gaseous flame,* either on carbon, or on some larger pieces of American plumbago. It

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was found that either lime or magnesia were fusible when exposed to the fire thus produced. This, however, may have been caused by the iron contained in the carburet, for the fused earths and plumbago generally adhered to each other.

"There is a peculiar species of native coal found on the banks of the Lehigh in this State, which it is extremely difficult to ignite; but, when exposed to an high degree of heat, and a copious blast of air, it burns, yielding an intense heat, without either smoke or flame, and leaving little residue. By exposure to the *gaseous flame* on this coal, both magnesia and lime exhibited strong symptoms of fusion. The former assumed a glazed and somewhat globular appearance. The latter became converted into a brownish semivitreous mass."

Before parting, we must observe, upon this instructive passage, that the phrase "gaseous flame" appears to us to be an instance of tautology. According to our understanding of the matter, all "flame" is "gaseous;" and the very essence of *flame* consists in its being *gaseous*. If it was not so, it would not be flame. The word flame, then, includes the idea of its being a burning gas. Besides, this is no more a gaseous flame than the blaze of a candle, or of a hickory fire, or a blacksmith's forge; one of which is as much a gaseous flame as the other.—For the analogy between this machine and the thermo-lamp, see our vol. v. p. 463—464, and 474—475.

ART. II. *Transactions of the American Philosophical Society, held at Philadelphia for promoting useful Knowledge. Volume the fifth.* 4to. pp. 328. *Philadelphia.* Dobson. 1802.

ANOTHER volume, published so soon since the appearance of the last, gives a favourable aspect of the enterprize of this respectable association. And the friends of American improvement have additional reason to rejoice in the scientific taste and research which is increasing very rapidly among our fellow citizens. Their highly welcome publication is a continuation of the work, of which an account was given in our vol. iv. p. 65, 179, 408, successively, and which was extended to vol. v. p. 67 & seq.

On examining the book now in our hands, we find several articles contained in it already noticed in our Medical Repository. For instance, the advertisement, in the introduction, concerning the *Magellanic Premium*, was published in vol. v.

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p. 349: Dr. Cathrall's *Memoir on the Matter of Black-Vomit*, published herein, p. 117, was reviewed in our vol. iv. p. 163: Dr. Priestley's *Six Essays on Chemical Subjects*, filling the first fifty pages, were also reviewed in the same vol. p. 385: and of Dr. Barton's *Tract on the Poisonous Honey of North-America*, contained in p. 51 & seq. a review was likewise given in our vol. v. p. 47. To these several passages of the Medical Repository we refer our readers; it not being necessary to repeat to them subjects so recently and amply discussed, and to which they can so readily turn.

Having mentioned these things, we proceed to the papers of which there is no account in our work. And of these, the first which presents itself is a paper

On the Ephoron Leucon, usually called the White Fly of Passaick River. By Dr. Williamson.

Until now, the *ephemeron*, or *insect of a day*, was considered as the most short-lived of the animal race. But Dr. Williamson has made us acquainted with an *epohron*, or *insect of an hour*. This is his generic denomination; and he has given the creature the specific title of λευκον, *album*, on account of its *white* colour. He says it belongs to the order of the Neuroptera, and has not been described by the entomologists. They appear every year, about the 20th of July, from the waters of the River Passaick, in the evening, about 35 or 40 minutes after sun-set, and continue to fly for nearly three weeks. Each generation dies, after enjoying life, in the perfect or *imago* state, about an hour, and probably no individual of them ever sees the sun. Their range is not more than two and an half miles on the river, extending only from three quarters of a mile below the bridge at Belville, to one mile and a half above it; and are not known on any other river. Their numbers are so great as almost to look like driven snow. They usually play near the surface of the water; seldom rise more than eight feet above it; and the female lays her clusters of eggs before she dies.—We agree with Dr. W. that this animal, "the insect of an hour that is never at rest," is a subject for a stonger allusion or comparison than the trite *ephemeron*, whose life is four-and-twenty times as long.

Remarks on certain Articles found in an Indian Tumulus at Cincinnati, &c. By George Turner.

This paper chiefly contains descriptive and explanatory remarks on the articles, which are deposited in the society's museum.

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A Drawing and Description of the Clupea Tyrannus and Oniscus Prægustator. By Benjamin Henry Latrobe, *F. A. P. S.*

The fish which Mr. Latrobe describes is the *morsch-banker* of the Dutch settlers about New-York, and the *menhaden* of the Mohegan natives. It is of a middle size between a shad and a herring, and of the same family. It visits the American coast in the spring, and continues until late in autumn. It is so numerous, and swims in such large shoals, that it is employed by farmers for manure. Land, improved by these fishes, produces maize and wheat of a most luxuriant growth, but soon loses its richness. During their putrefaction they are very offensive, and sometimes noxious, and, therefore, ought to be buried in earth or compost, and kept at some distance from the dwelling house. When fat, which is generally the case in October, they are very good to eat, and are salted down for winter's use by many careful housekeepers on the sea-coast. Is it the *twaite* of the Severn? (3 Pennant, British Zool. p. 351.)

Mr. L. relates what he saw and learned of this fish, which he calls the *bay-alewife* (clupea *nondescripta**), on York River, in Virginia, in 1797. Having done this, he proceeds to give the history of an insect which infests the fish. This is a species of ONISCUS, a genus of the order *aptera*. He seems to know but one species of it, the *physodes;* though, if he had looked no further than Pennant's Zoology, he might have seen figures of half a dozen other species; to wit, the *oniscus psora, lineari, marinus, oceanicus, entomon*, and *oestrum*, found in the British seas only. We have often observed the insect which Mr. L. mentions in the mouths of the *menhaden*, and can bear witness of the general correctness of his observations. There are *thirty-eight* species described in Gmelin's edition of Linnè's System of Nature. Of these it is probably the *oniscus asilus*. We think there is something quaint or forced in calling a weak, harmless and toothless fish *a tyrant*, because he is incapable of dislodging a fourteen-footed louse which has fastened on his mouth and gills; and there appears to be somewhat quite as odd and singular in calling this tormenting reptile *a fore-taster* (prægustator) to his tyrant, when, instead of tasting first to save his master from poison,

* We are not positive whether it is described: if not, the *clupea thrissa* comes nearest to it. E.

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be, in fact, is preying upon him, and harassing him with all his might.—We would suggest to Mr. L. when he again examines this fish, to give the history of another animal which adheres to him. The creature we allude to is rooted, or anchored, as it were, in his back and sides, and hangs down along them from a slender and flexible foot-stalk. Frequently there are so many of these *worms* to be seen sticking in the skins of the *menhaden*, that the fishermen throw them away as unfit to eat. From the circumstances of their bodies being roundish, oblong, soft, and affixed to another body, we suspect it to be a species of *actinia*.

Two ingenious pieces of mechanism are described as the inventions of the Rev. Burgiss Allison, A. M. the one being *a newly invented Globe Time-Piece*, and the other *a Pendant Planetarium*. But as these cannot be rendered intelligible without the plates, we refer our readers to memoirs No. XI. and XII. of the volume.

On the Use of the Thermometer in Navigation. By William Strickland.

The author endeavours to show the probability of a current continued from the Gulf-stream, by the banks of Newfoundland, quite to the coasts of Ireland and the Hebrides. Vessels, he supposes, have sometimes long passages from Europe to America on account of the difficulty of stemming this current: and recommends it as desirable to have the Atlantic Ocean explored between the 47th and 60th degrees of latitude, to ascertain the reality and extent of it. In this work he thinks the thermometer may be of service, by determining the heats of different portions of ocean—the Gulf-stream being the warmest.

Mr. Strickland is also inclined to think the thermometer may be useful in ascertaining a ship's situation at sea. The quicksilver falls on approaching banks and shoals in so sensible a manner, that, on the same parallel of latitude, he observed a difference of 20 degrees between the temperature of the ocean out of soundings, and of that which covers the bank of Newfoundland. The mercury rises again when a ship sails from shallow to deeper water. And this is capable of aiding the judgment in approaching shoals, or receding from them. He makes the temperature of the ocean, off the Grand Bank, to be 68 deg. of the neighbouring Gulf-stream 72, and of the water on the Grand Bank itself 52. He states the utility of the thermometer in finding the Gulf-stream, and its northern eddy, so as to enable ships to quicken their passages

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from Europe to NewYork, and the south-western ports of the United States.

It seems reasonable that this may be a good auxiliary in navigation, and be employed in addition to the log, the lead, and the quadrant, for conducting vessels securely through the pathless tracts of ocean.

Sur les Vegetaux, les Polypes et les Insectes: i. e. On Vegetables, Polypes and Insects. *By* Dupont de Nemours.

This piece contains a variety of miscellaneous observations on the subjects named in its title. It is printed in French. They appear to be the speculations of a cultivated and fanciful mind. In such works as Bonnet's *Contemplations* and St. Pierre's *Etudes*, they would be well deserving a place; but what do they here?

Observations on the Soda, Magnesia and Lime contained in the Water of the Ocean; showing that they operate advantageously there by neutralizing Acids, and, among others, the Septic Acid; and that Sea-Water may be rendered fit for washing Clothes without the Aid of Soap. By Samuel L. Mitchill.

In consequence of numerous analogies and inductions, Dr. Mitchill has persuaded himself that the *alkaline* matters dissolved in the ocean keep it sweet and wholesome, by the strong antiseptic power which they possess. He shows, in this short, but highly interesting memoir, that they have a further effect, which is to neutralize the *muriatic* acid which is always there, the *septic* which is frequently, and the *sulphuric* which is sometimes contained in sea-water. The three alkalies of *soda*, *lime* and *magnesia*, combine with the three acids, in the order of their respective attractions; and as there is a deficiency of soda, the residue of the acids combine with the earthy bases of magnesia and lime. The consequence of this constitution of ocean-water is, that it decomposes soap by separating the alkali thereof from its oil; and thereby renders it unfit for washing clothes.

Dr. M. is convinced that much of the sickness, fever, infection, &c. on ship-board, proceeds from human nastiness accumulated in cloathing, bedding, births, &c. through want or neglect of *alkaline* detergents. And he proposes, which is the principal object of his paper, to render ocean-water fit for washing, by precipitating the magnesia and lime with pearl-ash and soda. Thus sailors may wash and be clean without either soap or fresh water: for a few casks of pearl-ash, or of barilla,

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taken on board as a part of a ship's stores, will be capable of alkalizing sea-water so effectually as to do all the scrubbing, washing and cleaning on board. By this provision soap may be dispensed with, and not a drop of the vessel's stock of *fresh* water be consumed, beyond the daily allowance for cooking, &c. Health and comfort may thus be introduced into naval service, and the engendering of fevers and pestilential distempers on board be prevented. It is easy to foresee, that, upon this plan of cleanliness, quarantines of vessels would be in a great degree superceded, or, if they were insisted on, would be reduced to an exact system of purification.

The *Description of a Hopper for the Openings by which the Sewers of Cities receive the Waters of their Drains, by* John Fraser, *of Chelsea, London* (p. 148), is worthy of being consulted by police officers and city magistrates. The parts have a considerable resemblance to the hopper and shoe of a grist-mill, and seem well adapted to prevent the regurgitation of the fluids which have passed them.

A Memoir on Animal Cotton, or the Insect Fly-Carrier. By M. Baudry des Lozieres, *&c.*

This is the history of a voracious worm, well known in St. Domingo for the damage it does the indigo and cassada plants. It is so remarkable that we give it in the author's words:

"*Its Birth, Growth, and Death.*—The cassada-worm is produced like the silk-worm, that is to say, from the eggs which the mother scatters every where, after she has undergone her metamorphosis into a whitish butterfly, or of a light pearl colour.

"The egg is hatched about the latter end of July. Its developement is quick, for in September the worm is changed into a butterfly.

"This month of September is the season of his loves. The constant motion of his wings shows the ardency of his passion, which he indulges day and night, and even while feeding. The excess of this indulgence soon destroys him: he dies in the same month, after violent convulsions.

"I have said that his life begins at the end of July. He is decked at his birth with a robe of the most brilliant variegated colours. This elegant livery, which nature seems to have delighted in forming, renders him always agreeable to the eye, which always dwells upon it with pleasure.

"*Its Affinities.*—It has appeared to me to be a smooth caterpillar, whose external shape is exactly like that of the silk-worm.

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"It differs, however, from it, by its size, by its thickness, and by the beauty of its colours.

"It again differs from the silk-worm, because it does not itself work the cone which I am going to speak of.

"I leave it to the learned to delineate its external configuration, and to determine upon the family of insects to which it belongs. I shall only say that I do not believe it has, like the silk-worm, an intestine going in a direct line from the mouth to the anus, because it appears to me that this cause of elaboration would not have the same destination.

"*Its Food.*—It feeds on cassada leaves, of which it is extremely greedy. It feeds at all hours, day and night. It also nibbles the leaves of the potatoe: this is, however, but a transitory taste: it soon returns to the cassada leaf.

"I have to observe, that after it has taken its food, when the time of its metamorphosis arrives, it does not purge itself by diet, like the silk-worm, but continues to eat to the last moment.

"*The Approach of its Metamorphosis.*—In the month of August, and when on the point of undergoing its metamorphosis, it strips off its superb robe, and puts on one of an admirable sea-green. This fundamental colour reflects all its various shades, according to the different undulations of the animal, and the different accidents of light.

"*The Sting of the Ichneumon Fly.*—This new decoration is the signal of its tortures.—Immediately a swarm of ichneumon flies assail it. I think I am not mistaken when I assert that there is not one of its pores that has not one of those flies fastened to it. There is even no necessity of making use of the microscope to see that he is covered with them.

"In vain he struggles with all his might—raises himself upright to get rid of his cruel tormentors. He must submit. Those flies, of the smallest species, and which can only be studied by means of the microscope, drive their stings into the skin of their victim, over the whole extent of his back and sides. Afterwards, and all at the same time, they slip their eggs into the bottom of the wounds which they have made.

"After having performed this dreadful operation, the ichneumon flies disappear, and the patient remains, for an hour, in a drowsy, and even motionless state, out of which he awakens to feed with his former voracity. Then he appears much larger, and his size increases every day. His green colour assumes a deeper hue, and the tints produced by the reflection

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of the light are more strongly marked. The animal, in this state of factitious pregnancy, if I may so express myself, is worthy of all the attention of the observer of nature.

"I shall not undertake the description of the ichneumon fly; it is well described in the books. If I have observed a difference, it is the same which exists between the European *gnat* and the *musquitoe* of hot regions—that is to say, that our West-India flies are of a lesser size.

"I have now to describe the operation which the ichneumon flies, which are extremely small, perform at the very moment of their coming into the world.

"*Animal Cotton.*—A fortnight after the ichneumon flies have thus cruelly deposited their eggs, by perforating the unfortunate cassada-worm, that is to say, some time in the month of August, those eggs may be seen, by the help of a microscope, hatching on the body of that animal.

"Those eggs are all hatched at the same moment, and it is impossible to catch the moral point of time which may intervene between the birth of one and that of another. At one glance, the cassada-worm is seen covered with all the little worms that have just been hatched. They issue out of him at every pore, and that *animated robe* covers him so entirely, that nothing can be perceived but the top of his head. He then turns to a dirty white. The little worms appear black to the eye, but their true colour is a deep brown.

"This operation lasts hardly more than an hour, and is followed by another, which is not much larger, but which is much more curious.

"As soon as the worms are hatched, and without quitting the spot where the egg is which they have broke through, they yield a liquid gum, which, by coming into contact with the air, becomes solid and slimy.

"At the same time, and by a simultaneous motion, they raise themselves on their lower extremity, shake their heads and one half of their bodies, and swing themselves in every direction. Now is going to begin an operation which will afford the greatest delight to the admirer of nature.

"Each of those *animalcula* works himself a small and almost imperceptible cocoon, in the shape of an egg, in which he wraps himself up. Thus they make, as it were, their winding-sheet. They seem to be born but to die.

"Those millions and millions of cocoons, all close to each other, and the formation of which has not taken two hours, form a white robe, in which the cassada-worm appears ele-

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gantly clothed. While they are thus decking him, he remains in a state of almost lethargic torpidity.

"As soon as this covering is woven, and the little workmen who have made it have retired and hid themselves in their cells, the worm endeavours to rid himself of those barbarous guests, and of the robe which contains them; but he does not succeed in this attempt without the greatest efforts.

"He comes out of this kind of enclosure entirely flaccid and dull. Instead of his former fat and shining appearance, his skin now appears flabby, wrinkled and dirty, and gives him the appearance of decrepitude. He is now an exhausted, suffering being, threatened with approaching death.

"He will still gnaw a few leaves, but he no longer eats with that voracious appetite which indicated an active and vigorous constitution. Shortly afterwards he passes to the state of a crysalis; and, after giving life to thousands of eggs, he suddenly loses his own, leaving to the cultivator, who has not yet bethought himself of calculating the advantage that he may draw from him, an advantage which may be so improved as to much more than compensate the ravages which he occasions.

"*Shell of the Ichneumon Fly.*—I had imagined that the thousands of little worms which this shell contains in the cocoons of which it is composed, would be hatched some day. I shut it up, therefore, in a box closed with great caution. Every morning, and very often in the course of the day, I examined it, in order to catch the moment when those little animals were to be born a second time.

"In fact, at the expiration of about eight days, I found the inside of the box lined with a cloud of little flies. I made myself certain that they issued out of the little cocoon. Several which issued out of them before my eyes, left me no doubt as to the fact.

"I then took up some of those flies, and, putting them on a pincer, I examined them with a microscope.

"They are bold and lively: they have four wings: their antennæ are long and vibrating: their belly hangs by a very fine thread: there are some that have a tail, and others that do not show it. Afterwards I satisfied myself that they feed upon small insects that appear to be of the family of *Acarus*. Those indications appeared to me sufficient to be satisfied that they belong to the family of the ichneumon.

"*Observations on Animal Cotton.*—I have often held in my hand that cotton shell or wrapper. Its whiteness is daz-

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sling. As soon as the flies have quitted the cocoon, it may be used without any preparatory precaution. It is made up of the purest and finest cotton.

"I call it *cotton* because it is *idio-electric*, and is pervious to the electric fluid.

"I add to this denomination the epithet *animal*, in contradistinction to common cotton, which may henceforth be called *vegetable cotton;* so that the two species may be distinguished from each other by their names, as they are by their origin, although they are very nearly related to each other in their effects.

"It is to be observed, that what might be called *cotwch* in the covering of the fly-carrier, or small flocks of silk which are probably intended to shelter the animal from the rain, is far superior to what is called *ferrit* before, and *sleet silk* after the preparation of the finer silk. There is no refuse, no inferior quality in animal cotton. Every thing in it is as fine and beautiful as can be imagined.

"It is possible, if we may form a judgment by analogy, that medicine, which has extracted from silk what is called *English drops*, a remedy to which the greatest efficacy is attributed, may derive a similar advantage, perhaps for the cure of other disorders, from an extract of the animal cotton, which might be called the *St. Domingo drops*.

"In short, there is no need here of any of the precautions which the silk-worm requires. The robe which covers the fly-carrier is worked every where, and every where perfectly well.

"I shall only observe, that as the rain speedily destroys the cassada-worm, the instant might be seized on, when the ichneumon fly has deposited her eggs, to put the fly-carrier under shelter. His natural food might be procured for him, as is done with the silk-worm.

"The ichneumon-fly never fails thus to come and deposit her eggs. I have never seen a fly-carrier that was not covered with the robe or shell that I have spoken of. I have continued this observation for many years, and the crop was so abundant, that I alone could collect, in less than two hours, the quantity of one hundred pints, French measure.

"I repeat it, animal cotton is attended with none of the difficulties which occur in the preparation of vegetable cotton. It is so pure, that as soon as the ichneumons have left it, which happens eight or ten days after their reclusion, it may be carded and spun.

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"If it should want any preparation, it could be only in case it should not have been sufficiently guarded against dust and rain.

"Vegetable cotton, besides the seeds that produce it, and with which it is charged, is filled with extraneous matter, of which it cannot be freed, but with a minute attention, many hands and much time, or with the help of machines which have not yet been brought to perfection.

"In every point of view, animal cotton appears to me to have a great superiority over that of the vegetable kind."

Mr. ANDREW ELLICOT, the Geographer-General of the United States, while employed in public service, has preserved a regular diary of some of his transactions. These he has communicated at large to Robert Patterson, Esq. one of the Vice-Presidents of the society. One of these is entitled, *Astronomical and Thermometrical Observations, made at the Confluence of the Mississippi and Ohio Rivers; to which are added, Observations made on the Transit of Mercury, in May*, 1799, *at the Miller's Place, in lat.* 30 *deg.* 49 *min.* 33 *sec. N. on the Coenecuch River.* The other consists of *Astronomical and Thermometrical Observations, made on the Boundary between the United States and his Catholic Majesty.*—The former of these communications is dated August 4, and the latter September 23, 1800. They are drawn out to great length, and contain minute details of the heat, cold, clearness and cloudiness of the atmosphere; of the movements, occupation and employment of the geographer and his attendants; and of the instruments and apparatus, with the method of proceeding, to determine terrestrial boundaries and territorial lines, and to note the corresponding motions and phases of the heavenly bodies. These journals of events are spread over great surface, for they occupy all the part of the volume which is included between the 162d and 311th page inclusive; amounting to almost half the matter contained in the book. They may be useful to future surveyors; but it seems to us the *instructive* parts of the narrative might have been comprized within much narrower limits. Yet we must own there is something highly satisfactory in being able to resort to *original* documents. And, upon the whole, notwithstanding the prolixity and tediousness which we have heard some persons allege against these *Thermometrical and Astronomical Observations*, we have expressed our approbation of the society's vote to publish and preserve them entire.

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Mr. E. has settled the mean latitude of the confluence of the Mississippi and Ohio to be 37, 0, 22. 9, N. and the mean longitude 88, 50, 42, W. from Greenwich. (p. 170, 171.)

He has ascertained the mean latitude of Natchez to be 31, 33, 48, N. nearly (p. 190), and the mean longitude to be 91, 29, 16, W. from Greenwich. (p. 189.)

The latitude of New-Orleans he makes 29, 57, 28. 7, N. and its longitude 90, 14, W. from Greenwich. (p. 196, 197.)

The astronomer or statesman who is curious to peruse the account of the steps taken to settle the contested boundary between the United States and the Spanish provinces of East and West Florida, begun in May, 1798, and concluded in 1800, may here find the proceedings at large. The measures adopted to fix the 31st degree of north latitude on the Mississippi, and to traverse the country on a line drawn E. from that point to the source of St. Mary's River, are instructive to the geographer and surveyor. The maps which accompany the descriptions add greatly to their value.

Observations on the Figure of the Earth. *By* Joseph Clay, *M. A. P. S.*

Mr. Clay having read the Abbè St. Pierre's arguments in favour of the *prolate*-spheroidal figure of the earth, considered them utterly insufficient to establish the position. The object of the present paper is to prove that the earth is an *oblate*-spheroid. In this he has shown a large share of mathematical acuteness.—This subject, which has been violently disputed by great mathematicians, is not yet wholly settled to the satisfaction of *all*. Mr. C. takes the Newtonian side of the argument, and manages it with ability. An instructive and amusing history of the opinions of astronomers and geographers, as they fluctuated between a spheroid *extended* or *flattened* at the poles, has been drawn up by WEIDLER, in his *Institutiones Matheseos*, p. 457 & seq. Be the fact as it may, if, as the best calculators seem latterly to think, the radius of the equator is to the semi-axis of the earth only as 179 is to 178, there is no *great* matter to dispute about.

Description of some Improvements in the Common Fire-Place, accompanied with Models, &c. *By* C. W. Peale *and his Son* Raphaelle.

This is an addition of what the inventors term a sliding mantle-piece, and valve or damper, to the fire-place, with slanting jambs, recommended by Count Rumford. To get a complete idea of it, our domestic economists are referred to the explanatory plate, p. 322.

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To the volume is added an appendix of two communications *on the best method of preventing the premature decay of peach-trees.* The first was written by Mr. John Ellis, of New-Jersey; and the second by Mr. Thomas Coulter, of Pennsylvania. Both were prize-essays for the premium of 60 dollars, which was offered by the society, and adjudged to be divided between the candidates.—These pieces we insert entire for the gratification of our friends and readers who are devoted to rural life.

Account of a Method of preventing the Decay of Peach-Trees. By John Ellis, *of New-Jersey.*

"The decay of peach-trees is owing to a worm, which originates from a large fly, that resembles the common wasp. This fly perforates the bark, and deposits an egg in the moist or sappy part of it. The most common place of perforation is at the surface of the earth, and as soon as the worm is able to move, it descends into the earth, probably from an instinctive effort to avoid the winter's frost. This may be ascertained by observation; the tract of the worm from the seat of the egg being visible at its beginning, and gradually increasing, in correspondence with the increasing size of the worm: its course is always downwards. The progress of the young worm is extremely slow, and if the egg is deposited at any considerable distance above the surface of the earth, it is long before the worm reaches the ground. The worms are unable to bear the cold of winter unless covered by the earth, and all that are above ground after frost are killed.

"By this history of the origin, progress and nature of the insect, we can explain the effects of my method, which is as follows: In the spring, when the blossoms are out, clear away the dirt, so as to expose the root of the tree, to the depth of three inches; surround the tree with straw about three feet long, applied lengthwise, so that it may have a covering one inch thick, which extends to the bottom of the hole, the but ends of the straw resting upon the ground at the bottom. Bind this straw around the tree with three bands, one near the top, one at the middle, and the third at the surface of the earth; then fill up the hole at the root with earth, and press it closely round the straw. When the white frosts appear, the straw should be removed, and the tree should remain uncovered until the blossoms put out in the spring.

"By this process the fly is prevented from depositing its egg within three feet of the root, and although it may place the egg above that distance, the worm travels so slow that it

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cannot reach the ground before frost, and therefore is killed before it is able to injure the tree.

"The truth of the principle is proved by the following fact—I practised this method with a large number of peach-trees, and they flourished remarkably, without any appearance of injury from the worm, for several years: I was then induced to discontinue the straw with about twenty of them. *All those which are without the straw have declined, while the others which have had the straw continue as vigorous as ever.*"

Description of a Method of cultivating Peach-Trees, with a View to prevent their premature Decay; confirmed by the Experience of forty-five Years, in Delaware State and the Western Parts of Pennsylvania. By Thomas Coulter, *Esq. of Bedford County, Pennsylvania.*

"The death of young peach-trees is principally owing to planting, transplanting, and pruning *the same stock*, which occasions it to be open and tender, with a rough bark; in consequence of which insects lodge and breed in it, and birds search after them, whereby wounds are made; the gum exudes, and in a few years the tree is useless. To prevent this, transplant your trees as young as possible; if in the kernel it will be best, as there will then be no check of growth. Plant them sixteen feet apart. Plow and harrow between them, for two years, without regard to wounding them, but avoid tearing them up by the roots. In the month of March or April, in the third year after transplanting, cut them all off by the ground, plow and harrow among them as before, but with great care to avoid wounding or tearing them. Suffer all the sprouts or scions to grow, even if they should amount to half a dozen or more; they become bearing trees almost instantaneously, on account of the strength of the root. Allow no animals but hogs to enter your orchard, for fear of their wounding the shoots, as a substance drains away through the least wound, which is essential to the health of the tree and the good quality of the fruit.

"If the old stock is cut away the third year after transplanting, no more shoots will come to maturity than the old stump can support and nourish: the remainder will die before they bear fruit, and may be cut away, taking care not to wound any other stock. The sprouts, when loaded with fruit, will bend and rest on the ground, in every direction, for many years, all of them being rooted as if they had been planted, their stocks remaining tough and their barks smooth for twenty years and upwards. If any of the sprouts from the old stump should happen to split off and die, cut them away; they will be supplied

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from the ground by others, so that you may have trees from the same for 100 years, as I believe. I have now trees from one to thirty-six years old, all from the same stump. Young trees, formed in this manner, will bear fruit the second year, but this fruit will not ripen so early as the fruit on the older trees from the same stump. Three years after the trees are cut off, the shoots will be sufficiently large and bushy to shade the ground so as to prevent the growth of grass that might injure the trees, therefore plowing will be useless, and may be injurious by wounding them. It is also unnecessary to manure peach-trees, as the fruit of manured trees is always smaller, and inferior to that of trees which are not manured. By manuring you make the peach-trees larger and apparently more flourishing, but their fruit will be of a bad kind, looking as green as the leaves, even when ripe, and later than that of trees which have not been manured. Peach-trees never require a rich soil; the poorer the soil the better the fruit: a middling soil produces the most bountiful crop. The highest ground is the best for peach-trees, and the north side of hills is most desirable, as it retards vegetation, and prevents the destructive effects of late frosts, which occur in the month of April in Pennsylvania. Convinced, by long experience, of the truth of these observations, the author wishes they may be published for public benefit, and has been informed that Col. Luther Martin, and another gentleman, in the lower part of Maryland, have adopted a similar plan with great advantage."

ART. III. *Observations and Advices for the Improvement of the Manufacture of Muscovado Sugar and Rum. First Part. By* Bryan Higgins, *M. D.* 8vo. pp. 116. *With Plates. St. Jago de la Vega, in Jamaica.* Aikman. 1797.

FROM the time that the sugar-cane was transplanted to the West-Indies, the proprietors of estates experienced a great improvement of their property. On many of those fertile islands this plant grew with great luxuriance, and, reared by the labour of Negro slaves, afforded a very profitable crop. The sweet liquor expressed from this precious vegetable, at a proper season of its growth, gave rise to a triple employment; for, from it, the crystallization of *sugar*, the draining of *molasses*, and the distillation of *rum*, all derive their existence.

To manage with propriety a sugar plantation, required skill both in agriculture and manufacture.

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As far as the business of the mere planter extended, there seemed to be no lack of an economical system of labour. The preparation of the soil, the time for planting, the mode of tending, the season of cutting and gathering, were well understood. Nor was there less of knowledge of the constitutions of labourers, the signs of vigour when they were inspected at market, the manner of feeding them, the amount of work they could do, the diseases to which they were liable, with the proper discipline of unconditional subserviency and obedience.

But when the harvest was ripe, a work of greater difficulty remained. The saccharine juice, before it corrupted in or evaporated from the stalk, was first to be extracted, and afterwards to be converted into new and varied forms. Replete with a most fermentible matter, and growing in a heated climate, the management of it required dispatch as well as care. Abounding with water, it was necessary to boil it to dissipate the excess of that ingredient. Growing partially acid in spite of all endeavours to prevent it, there was a necessity to absorb or neutralize the sourness. Being easy of decomposition by fire, much caution was requisite to prevent the blackening of it in the boilers, and the burning of it to charcoal. Charged with crude, adventitious, filthy, or sometimes injurious materials, means were to be devised for purging these away.

All these and other difficulties retarded the preparation of *sugar*. Nor were the impediments smaller which attended the conversion of its skimmings and strainings into *ardent spirit*. Pure alkohol could never be obtained. A portion of empyreumatic oil passing with it through the still, gave it a strong and disagreeable smell. Particles of carbon or soot imparted to it a bitter or other unpleasant flavour. Or an ethereal fluid, formed during distillation, by a junction of acetic acid with nascent spirit, joined itself to the new rum, giving it a burning pungency, or an almost suffocating volatility. Other tinctures or taints, arising from the vitiated or impure mixture of the materials for distillation, rendered the fresh drawn rum too unpalatable for immediate use, except by the lowest of those wretched creatures, who swallow these draughts, as they would take into their stomachs worse ones, for the purpose of intoxication.

Processes so complicated, and accompanied with such manifold embarrassments, could not be brought to perfection immediately. Time, and skill and experience, were to be

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combined in order to economize and simplify such intricate operations. The sense of private emolument was a powerful incentive to the more ingenious and enterprising planters. Knowing the defects of the management adopted both in their sugar-houses and still-houses, they beheld with impatience the wasteful way of working. Expedient succeeded to expedient, and project to project, for the purpose of making greater savings in both the manufactures. Though much was done by the successive exertions of proprietors, overseers and artists of every kind, they all remained sorrowful witnesses, in spite of all they could do, of some irremediable defects in the boiling of sugar and in the distilling of rum.

The agreeable sweetness produced by sugar, when dissolving between the tongue and the palate, and the glowing excitement caused by rum, when acting upon the stomach and nerves, have recommended these two commodities to general use. This is so much the case, that, from having been luxuries, they are now almost reckoned among the necessaries of modern living. Without the former to sooth the mouth, and the latter to warm the belly, multitudes of our fellow creatures would think themselves miserable indeed! The history of such ingredients of human provision and solicitude can scarcely be a matter of indifference to any one. The cultivator studies it as he values increasing thriftiness and gain; and the consumer ought to become acquainted with it through a regard to rational curiosity and health. The active ingredients of diet and medicine are grave subjects of meditation to us all.

The Jamaica planters having exhausted all the resources of practical or empirical contrivance, possessed too much knowledge of what was proper to be done, to abandon the pursuit as desperate. They had recourse to such aid as *Science* promised to afford them. From the numberless benefits which chemistry had showered down upon other useful arts and manufactures, they hoped it might pour forth a portion of its blessings upon theirs. They applied to BRYAN HIGGINS, a respectable physician of London, a man long and deeply versed in chemical researches, for advice. They retained him in their service by an offer of liberal reward, and engaged him to make a voyage to the south-western regions, where their fertile plantations laid waiting for his improvements.

The volume now in our hands was composed in consequence of this accepted mission. It consists of three distinct publications, made between the years 1797, when Dr. H. ar-

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rived in Jamaica, and 1801. These were successively printed at St. Jago de la Vega, and addressed to the committees appointed by the legislature of Jamaica to confer with him, and to facilitate his proceedings. But we proceed with the work.

Having the interests of his employers at heart, Dr. H. soon furnished them with a book. From the observations which he made on the plantations immediately after his arrival, he became satisfied that, in order to have good rum, it was necessary to prepare good sugar; and that, of course, all radical reforms, calculated to improve the processes in the still-house, ought to be begun in the sugar-house. The principal points to be carried, for improving the manufacture of muscovado sugar, were these: 1. To quicken the conversion of crude cane-juice to syrup or sugar. 2. To separate the foul, adventitious and putrefactive matter, which unavoidably mingles, in some proportion, with the juice. And, 3. By having thus improved the sugar in colour, grain and purity, to prepare the sweets for distillation, free from acid and corrupting taints.

To the accomplishment of these objects he devotes the principal part of the tract now under consideration. He proposes to effect it by various improvements in the furnaces. He recommends better modes of construction, a more convenient application of heat, and a preferable arrangement of the vessels for boiling. He treats of economizing fuel, of skimming off the light matters which rise to the surface, of filtering the liquor through proper strainers, and of neutralizing the acidity usually prevalent in the juice, especially if kept so long as to ferment. A large part of this tract, therefore, is filled with directions to intelligent planters and operative masons, how to construct the boiling apparatus in the most advantageous manner. In doing this Dr. H. writes much about bars and grates, flues and fire-places, bricks and cements, sizes and dimensions, which we deem it unnecessary to analyze or transcribe. Being expressly calculated for the improvement of the plantations, we forbear to go into minute discussions about them, as they can only be understood in connection with the engravings. Toward the end we find some observations concerning the quickest preparation of muscovado sugar and the improvement of rum, which are worthy of insertion entire, as they throw much light upon these subjects. (p. 94.)

"Sound cane-juice consists of water, sugar, deliquescent sweet, herbaceous matter, carbonic acid, and molasses acid:

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And some juices contain variable quantities of other ingredients which are not yet to be noticed.

"In these pharmaceutic ingredients subsist the primary or chemical principles of many vegetable acids. But experience shows that the composition of attractive forces, resulting from such proportions of the principles as take place in the recent juice, tend chiefly to the formation of an acid similar to vinegar, and of an additional quantity of carbonic acid and molasses acid.

"For in the course of 12 or 18 hours the juice mantles by the rise and escape of carbonic acid in the elastic state: At an earlier period it smells sour or acetous; and, by the effect of such delay on the sugar producible from it, it is certain that there is an addition to the original quantity of the molasses acid.

"This last is the ingredient which most powerfully impedes the crystallization and separation of the saccharine matter from the deliquescent sweet and mother-liquor called molasses. As it lessens the quantity of saccharine crystals, and increases that of molasses mother-liquor; and as it is highly probable that molasses contains the like acid as a constituent principle, I give it the temporary name of molasses acid.

"Herbaceous matter is that of which some part shows itself in the *yawing*, and more in the boiling of juice which had been cleared from gross filth by filtration. It is that which we endeavour to separate from the saccharine liquor by *yawing* and skimming.

"The herbaceous matter has some analogy to gummi-resins; but has a much nearer similitude, in chemical character, to the dregs of refined indigo, or that vegetable substance which constitutes the chief difference between the finest and the basest indigo.

"The herbaceous matter of cane-juice, like that of indigo, varies with the constitution of the plant in different soils and seasons, and especially in respect to its solubility: insomuch that some juices hold about $\frac{1}{100}$th part of it in strict solution after boiling, whilst others hold not 1000th.

"But as herbaceous matter is rendered more soluble by the intervention of carbonic acid; any cane-juice holds more herbaceous matter in solution, before it has been heated, than it can retain at the temperature of yawing or boiling.

"For in the augmented temperature, the carbonic acid forsakes the herbaceous matter to combine with that which makes the acid aëriform; the minute gaseous bubbles in their escape agitate and impel the particles lately thrown out of solution,

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until, in their coalescence, they become not only visible but large. We may express this change in the clear recent juice by the agency of fire alone, as the workmen do, by saying the liquor breaks.

"Fresh cane-juice begins to break, when the heat approaches to 140 degrees of Fahrenheit; and the herbaceous matter which has felt no greater heat, has an olive green colour.

"Whether this be exposed to greater heat, or we advert to that which is thrown out during the subsequent reduction of the juice to sugar, the herbaceous matter is found to change colour with the increase of temperature, through gradations of yellow, olive, and brown, increasing in intensity and darkness, until the matter is charred to blackness. As it changes in colour it becomes less soluble. The carbonic acid continues to escape, and the extricated herbaceous matter accumulates to the surface, whilst the liquor is heated to 195.

"Now the watery vapour arising with the carbonic acid bubbles, pushes the cleansed liquor, frothing white, through intervals in the swollen scum. This, which is called yawing, shows that a greater heat would cause a boiling commotion. But if sometime be allowed for the residuary carbonic acid to escape, the liquor will not boil until this heat amounts to 206, or within five degrees of the heat of boiling water.

"The aëriform bubbles intangled in the herbaceous matter render it more buoyant than it would otherwise be, and enable it to carry with it, and to sustain at the surface any accidental filth of the liquor: And the scum thus produced is by its own nature sufficiently tenacious to be separable by the skimmer, or by drawing away the depurated juice from beneath it.

"But if the buoying bubbles be expelled by greater heat and the commotion of boiling, the scum will be broken into the liquor.

"The skimmer will now avail nothing; but the herbaceous matter once thrown out of solution will subside with the filth, in an hour, in a cooling quiescent liquor; and will leave it transparent, although it still retain that quantity of herbaceous matter, which the water, with the last adherent portions of carbonic acid, can dissolve.

"But as this depuration by subsidence cannot be awaited without injury to the juice, the foul scum ought to be removed before the liquor boils.

"In consequence of this limited solubility, the residuary herbaceous matter becomes extricated afterwards, in quantity proportionate to that of the watery solvent which is expelled by

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evaporation; and the reduced liquor becomes turbid by the extricated herbaceous particles.

" However often the process of evaporation is stopped and the liquor is depurated to perfect transparency, by subsidence, or otherwise; it will become turbid again, by the deposition of herbaceous dregs, when the evaporation is renewed; and it will thus yield dregs to the end; or until the residuary liquor becomes so far saturated with sugar as to be incapable of holding the less soluble herbaceous matter in solution.

" All this takes place, whether a moderate dose of temper be used or not. But the cleansing by subsidence is quickest when temper is used.

" To ascertain the true use of temper, we must advert to its agency on herbaceous matter, carbonic acid, and molasses acid.

" Lime powerfully attracts carbonic acid: And although lime be a soluble body, and although it meet the acid in the aëriform state, it forms with it quickly an insoluble body similar to whiting or chalk.

" Lime also combines with a triple or quadruple quantity of herbaceous matter, to form a compound less soluble than the latter in water: And in cane-juice, lime meeting carbonic acid and herbaceous matter, unites with both to form a triple compound. For if the lime used in clarifiers were to unite with the carbonic acid only, we should find bottoms consisting of whiting, which I have looked for, but could never obtain.

" It is by virtue of these relations, that a small quantity of lime, or transparent lime-water, in which the lime can be only $\frac{1}{100}$th part of the whole, when added to cane-juice that has been duly cleared, renders it presently turbid with herbaceous matter now extricated, and thus facilitates the abstraction of this matter by subsidence. Thus also cane-juice which is a little wheyey or clouded, is broken to flocculence, by transparent lime-water, as well as by lime.

" I say the liquor is broken to flocculence, when the particles of herbaceous matter, seized by those of the lime, and coalescing, appear large and flocculent; and the liquor interceding them is seen quite transparent, when viewed by transmitted light, in the narrow part of a wine-glass.

" This breaking may also be distinguished in a bright silver spoonful of the liquor, by reflected light.

" On these grounds, some lime ought to be added to cane-juice which contains the ordinary quantity of herbaceous matter; not with the vain hope of separating all the herbaceous

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matter at once; but with the experienced certainty, that the liquor yawed or cleansed with the aid of lime, will contain less herbaceous matter in solution than it would otherwise have retained, and will require the less additional lime to act on the molasses acid.

"Towards the kind of depuration which can be effected in the process of yawing, lime thus contributes something, but not nearly so much as has been generally supposed; for a quantity of lime which is sufficient to give a nauseous taste to the sugar, is yet incompetent to the extrication of all the herbaceous matter, so that it shall be separable by yawing or subsidence: and an excess of lime, not greater than $\frac{1}{2000}$ or $\frac{1}{3000}$ of the weight of the juice, is constantly attended with a manifest debasement of the colour of the sugar, when this excess takes place in the beginning of the boiling, or previous to the reduction of the juice by evaporation.

"It is of no practical use to inquire after every agency by which the excess of lime has these effects; but it is expedient to observe, that when a juice is yawed with excess of lime, and cleared to transparency by subsidence, which soon takes place in a specimen quickly cooled in a wine-glass, it will show colour approaching to that of porter; whilst the like juice, treated in the same way, but with only a moderate dose of temper, will be almost colourless when transparent.

"It is moreover to be observed in ordinary practice, that when too much temper has been used in the yawing, the liquor, during the boiling in the teaches, looks much browner than that which has been less tempered: the scum has a darker colour, and is more apt to break and sink into the liquor; and it has less of the tenacity and flocculence by which ordinary scum clings on the skimming instrument, and is separable by the common process.

"The practical inference from all these facts is, that the temper ought to be used sparingly in the raw juice in the operation of yawing; although it should be found necessary to use more temper afterwards, for purposes different from those lately recited.

"It is chiefly by reason of the agency of the temper on the molasses acid, or on that matter which most powerfully impedes the separation of the sugar from the molasses mother-liquor, that the temper is eminently useful in the manufacture of muscovado sugar, and that the greater quantities of it may be advantageously employed; provided the whole of it be not administered at once, and at the period of the manufacture in

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which it is apt to colour the juice, to lessen the buoyancy and tenacity of the scum, and to frustrate the labour of the skimmer."

Then follow Dr. H.'s remarks on filtration through a woollen blanket or swanskin, with the mechanism and pressure necessary to aid that operation; and his observations on what he calls a "spraying instrument," to prevent the sugar from burning to the bottoms of the kettles. To these are subjoined the following chapter on the subserviency of the measures proposed, to the improvement of rum. (p. 111.)

"Concerning rum it is now to be observed, that it derives the depreciating characters of the recent spirit from two sources; the chief of which is the filth of the scums, and especially of the first scums in yawing.

"The tendency of such matter, even if they were nothing verminous or animalcular in it, is to the putrefactive fermentation, or rotting; whilst that of the sweets is to the vinous fermentation, and thence to the acetous. The product of the former fermentation is as offensive to the smell and taste, and as noxious, as that of the latter is grateful and cordial.

"Wherever scums are detained to await the spontaneous separation of the sweets from the filth, an intestine motion may be observed; and there chiefly, in the concurrence of these fermentations, the offensive product is generated. The rest is formed in the fermenting vats, in quantity proportionate to the filth of this kind which passes into them.

"Every vinous liquor capable of yielding an intoxicating spirit by distillation, affords some quantity of peculiar essential oil, which awaits the rise of the water of the latter and weaker runnings, and characterizes them: Therefore this essential oil is in a great measure separable from the spirit by redistillation, especially if salts retentive of the water, and restraining the volatility of the oil, be used.

"But it is peculiar to the ordinary manufacture of rum, that a very offensive ethereal fluid is generated in these mixed fermentations; and that by reason of its volatility it is inseparable by re-distillation.

"But from the source above-mentioned, the essential oil of rum acquires extraordinary nauseousness; and as a single redistillation cannot exclude it totally, and as any number could not exclude the ethereal taint above-mentioned, the best new rum of any estate is that which runs intermediate, in respect to the offensive ether and the fœtid oily taints.

"All rum is improved by time in wooden casks, by exhala-

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tion of ether and absorption of oil, and under a growing charge for waste, and for interest on the price, and some have improved it sooner by ventilation, but not without a great waste of the spirit. But now it may be remarkably improved immediately, by measures which prevent the described contamination: And the first of these is the abstraction of the putrefactive matter by filtration, and the immediate conveyance of the clear warm fragrant liquor to the working cistern, there to undergo the most timely and productive fermentation, and to suffer the least defalcation of spirit by foul scum and bottoms, which are generally thrown away.

"Another source of the contamination is in the empyreuma: But as this regards the distillation, as well as the errors in making sugar, it is unnecessary to say more of it at present than that the prescribed measures, together with a judicious setting and management of the still, will totally prevent the empyreumatic smell and taste."

Part II.

Full of his occupation, Dr. Higgins, in this part of his work, dwells upon the details of the processes described in the first part. He is very particular in his instructions for fixing and employing filtering machines to remove gross and feculent mixtures. Many practical cautions are added on the erection of furnaces, disposition of the coppers, and the economy of labour, &c. These instructions, which are of the greatest use to the cultivator, are not likely to be very instructive or amusing to our readers; first, because they are devised expresly for the plantations where sugar is cultivated; and, secondly, because there are almost constant references to the drawings annexed. We therefore pass them by.

Part III.

Herein there is a recapitulation of the principal directions contained in the *first* and *second* treatises. As the works were published at different times, and might be dispersed, neglected or lost, Dr. H. brings to mind, very fully and forcibly, the capital instructions which he had published before, with such additional directions as his subsequent experience and reflection had suggested to him. He has done this so completely, that, in fact, this last piece almost contains the sum and substance of the whole performances. Many faults in the first part are corrected in this. In page 50 he has some remarks on cement and mortar, which we copy for the use of our readers; these

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remarks being applicable to every kind of bricklaying and masonry in all countries.

"As the cementing power of the mortar depends entirely on the lime, and as erroneous notions and practice in the preparation, keeping, and application of this article, have been productive of great mischiefs, we shall state the reasoning and the most useful advices, on these subjects, collectively, as follows:

"Every natural stone, whether hard or friable, or distinguished by the name of lime-stone, or marble, or chalk, if it yield good lime by burning, consists of about nine parts by weight of lime, or mere calcareous earth, and seven of carbonic acid.

"These principles are held coherent and combined in the native stone, by their reciprocal attractive forces: But by the attraction subsisting between each of them, and the matter of fire, by a law of nature, each of them is combinable with that matter, and actually unites with it in the high temperature of a lime-kiln.

"In this union, the carbonic acid, which was solid in the lime-stone, becomes a fluid invisible, expansive, permanently elastic, and soon dissipated in the common air: but the mere calcareous earth remains combined with a portion of the matter of fire only; of which a great part is discoverable, and even mensurable by modern instruments, when lime is slaking in water, or combining again with an acid. In the latitude of speech, however, we say lime-stone is converted to lime by the expulsion of the carbonic acid.

"If a composition be made of sand, water, and the finest powder of lime-stone, or of chalk, in the manner of mortar, it acquires no considerable solidity, or cementitious power in drying in time, or in exposure to the open air: And it is in consequence of the liberation of the lime from the carbonic acid of lime-stone, that the calcareous earth can act with its native unrestrained attractive and cementitious powers: All in conformity with a law of nature, which governs every kind of matter, even that of fire not excepted.

"As the fire is gradually administered and augmented in a lime-kiln, the carbonic acid is expelled in successive portions, from every stone; and it depends on the duration and intensity of the fire, whether one fourth, or three fourths, or the whole be expelled, and whether the product of the process be perfect lime, or a thing passing for lime, but really defective in regard to the cementing power, in proportion to the quantity of carbonic acid still retained.

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"By divers experiments described in the Author's essay on calcareous cements, it has been conclusively proved, that either in a close vessel or in an open fire, the whole of the carbonic acid may be extricated, and perfect lime may be made in three or four hours, if the fire be sufficiently intense: But that as the fire employed is weaker, less of the carbonic acid is expelled, and the product of the process is less competent to the uses of lime, however long the lime-stone may have been exposed to such weaker heat. It follows, then, that lime prepared with a brisk fire of a competent quantity of fuel, is preferable to that on which a much greater quantity of fuel may have been consumed in slower and weaker combustion.

"It is accordingly the practice in some places in England to burn in kilns of peculiar construction, and with a well ventilated fire, for the best lime for tarras and mortar of sluices and water fences, and for exportation in casks. But the more common practice there, as well as here, is to burn more slowly, and with no more fuel than is necessary to make the lime saleable, by the criterion of slaking with water. For the manufacturer of lime for sale finds that this answers his purpose; and those who burn for their own use imitate the common manufacturer, or take worse methods, for want of kilns.

"But the slaking is not a true test of the transition to good lime. For although there are particular hard and fine-grained lime-stones, which do not acquire this property before the carbonic acid has been expelled to the quantity of about five sixths of the whole; all chalks, marbles, divers lime-stones, and the brittle and coarse-grained especially, will slake when a much smaller quantity of the acid has been expelled. He who prepares such lime for his own use, and merely to avoid the consumption of a little more fuel, pursues a false economy: For exclusive of its being defective of the cementing power of lime, it is wasteful; because the more of it must be used in making mortar, for which the mason's rule is to add lime until the mass has plasticity enough to stick to the trowel, and hang at the joints.

"The proper test of lime is that which shows whether any carbonic acid, or what quantity, is still retained: And the simplest and fittest for popular use is the following:

"Into a mixture of two tea-spoons-full of water, with one of spirit of salt, or common marine acid, a tea-spoon-full of the lime moistened with water, to expel the interstitial air, is to be quickly blended.

"If there be any quantity worth notice of carbonic acid, it

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will be dislodged, and will issue forth in the form of an elastic fluid, not visible, but easily perceptible by the commotion, mantling, or effervescence which it will excite in the mixture.

" If there be no effervescence, the lime may be considered as completely burned. If by more of the acid the whole can be dissolved to liquor pretty clear, and showing little or no sediment, the lime may be considered as excellent for temper as well as for mortar. If the solution of non-effervescent lime shows a sediment fat and plastic like clay, it may, like Darking or Barrow Lime of England, be excellent for mortar, and especially for the tarras mortar of water fences; but it is yet to be inquired whether it be eligible as temper.

" In this probation by acid, the more the mixture effervesces, the worse is the lime for any of these uses.

" Where the marine acid cannot be had, strong vinegar, without any addition of water, excepting what moistens the lime, may be employed; but it does not serve so well as the former acid to detect small quantities of the carbonic acid; because there is no escape of the elastic fluid nor any effervescence, until the quantity liberated exceeds that which the water of the vinegar can retain.

" It is not to be inferred from these observations, that all the lime is defective, which is prepared by burning in the stratified field-pile; for when this is built very high, and is well stratified with a bulk of good wood, three or four times greater than that of the stone; when the combustion is quick, by reason of the free passage of air through the strata, and the wind is not strong enough to push the chief part of the flame to the leeward side; good lime may thus be obtained, with no great waste, by lime-core or stone imperfectly burned. But the consumption of wood, or the labour, is in this case enormous, in comparison with that which might serve in a kiln of judicious construction.

" It is not more necessary that lime should be sufficiently burned to serve by the smallest quantity for the best mortar, than that it should be preserved in this state, until it is applied to use. To this end it ought to be generally known, that it undergoes debasement and injury proportionate to the time and extent of its exposure to the atmosphere, from which it powerfully attracts moisture to slake it, and then re-absorbs carbonic acid, which the fluctuating air continually presents: And then it will be as generally believed, that in proportion to the quantity of acid thus resumed, the lime will gradually revert to what it was, at periods intermediate between the commencement

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and the completion of the process by which the lime-stone had been reduced to lime, and that the lime which has been much exposed is, in its cementitious powers, much the same as that which has been imperfectly or but slightly burned.

"In the latitude of common speech it may be said, that whilst lime is kept dry, it takes no damage from the air. But it would be more correct to say, it takes no damage whilst it remains unslacked; and this reason might be added: The same fiery agent which separated the principles of lime-stone, and combined with them severally, continues to keep them apart, until a new medium, such as water, interposes to expel that agent, and give preponderancy to the attractive powers, subsisting between the mere earth and the condensed carbonic acid.

"By the affusion of measured quantities of water to lime in close vessels, we learn that the slaked lime may hold a great quantity of water, and yet feel perfectly dry to the touch. Whether this quantity be a sixth or more of the whole weight of the lime, we cannot now recollect. But it is certainly great enough to show that lime slaked by moisture from the air, however dry the powder may feel, has the means of concentrating and imbibing the carbonic acid wafted to it in the air.

"In fact, slacked lime kept in a dry airy room becomes effervescent, by the quantity of carbonic acid imbibed in the course of a few weeks: And mortar used in masonry increases in hardness and in the effervescent quality, for months, if not for years, after the whole has been dried so far as to feel dry.

"Natural lime-stone, and lime restored to that state by the resumption of carbonic acid, are insoluble in water, or nearly so. But lime dissolves in less than six hundred times its weight of water, to form the transparent fluid called lime-water. This, when exposed to the open air, shows how quickly the lime, by the intervention of water, can resume carbonic acid from the air: for the earthy crust which presently forms at the surface exposed to air, and no where else, consists of lime reduced to the state of the native substance of lime-stone, to be effervescent in acid, and insoluble in water; and, however often this crust be broken in, a new one is formed in the same way, until the water is left destitute of lime.

"From these premises it follows, that mortar which is most quickly made and used in masonry will be the strongest; and that it is absurd to make immense quantities of mortar, with the view of improving it by keeping, unless the air be at the same time precluded."

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Having laboured thus far to meliorate and economize the manufacture of sugar, Dr. H. turns his attention (p. 157) to the improvement of rum. His object was to remove immediately, by chemical agency or superior management, that *haut gout* or *stinkabus* flavour which *new* rum almost always possessed in some degree, and which is usually removed only by age and keeping. His ideas may be perused in the following quotation. (p. 157.)

"In the fermentation of molasses and saccharine sweets, as well as in the like process for the production of ales and wines, from their respective fermentable subjects, the principal products are, 1. Alkohol; 2. Essential oil; 3. A saline oleaginous and earthy compound in the form of yeasty dregs; 4. Acetous acid, varying in quantity with the nature of the fermented subject, and with the circumstances of the fermentation; 5. Carbonic acid gas, which, in its escape, causes the commotion of the fermenting charge, and of which but little, comparatively, abides in the beverage; 6. Farina, or sweet, which has eluded this primary visible fermentation, and of which the quantity remaining unaltered is greater, as that of the concomitant alkohol is greater relatively to the water; for it is the nature of alkohol, in proportion to the quantity, to impede fermentations.

"By this agency of the spirit, and by the aid of pression in close vessels, and quiescence and coolness, each vinous beverage may be long preserved mellow and nutritious by the unaltered farina or sweet exhilirating by the alkohol, brisk by the detained carbonic acid, and all the while capable of that slow, invisible fermentation, in which the unaltered sweet or farina above-mentioned is gradually expended, in the formation of spirit and carbonic acid, to repair the waste of these by transpiration through the vessels or stopples. But when the purpose is speedily to obtain the greatest quantity of spirit, the fermentable subject is to be used in that smaller quantity, by which the most of it may be converted to spirit, and the least left unaltered; and the fermentation, and the expulsion of carbonic acid, are to be promoted by plunging, and by covers serving to retain the heat and the spirit, without compressing the charges.

"The essential oils evolved in the vinous fermentation, are as different in smell and taste as the fermentable subjects are different in kind or name. But in regard to the portions which accompany the water and spirits in distillation, they agree in the common character of rendering the spirits, and especially the

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weaker runnings ungrateful, if not unwholesome: And excepting what may depend on ethereal impregnation hereafter to be noticed, we may say generally, that the difference between any two or more of the spirituous liquors which are objects of commerce, depends on their essential oils. For as the proportion of these is lessened by the art of the rectifier, or chemist, and by transpiration through wooden vessels, these spirituous liquors become mellowed and grateful, and approximate each other in medicinal and chemical character.

"In charges productive of the best wines, or vinous liquors, this fermentation has its distinct time and progress, anterior to the acetous: But in fermentable charges of different descriptions, such as those which yield the meagre or acerb beverages, and such as those commonly fermented for rum spirit, an acetous fermentation accompanies the vinous; or acetous acid is formed in the very time of the vinous fermentation; to the perversion of ingredients that are common to spirit and to vinegar, and to another injurious effect hereafter to be shown.

"In the fermented liquor from which rum spirit is to be distilled, as well as in divers others above mentioned, acetous acid may subsit in considerable quantity along with the spirit, without uniting with it to form ether. But in the heat and vapour of the distillation, it is the nature of this acid to convert a proportionate part of the spirit into acetous ether, which, by virtue of its extreme volatility, rises along with the first and strongest spirituous runnings, and gives them smell and taste extremely ungrateful to every uncorrupted palate. Hence the adage that rum becomes more fiery by repeated rectification, such as serves to improve the European spirits: And the reason of it is, that the rectified spirit is but a part of the still-charge, and yet contains the whole of the ether.

"The most judicious manufacturers of the more grateful spirituous liquors, take the greatest care to exclude from the fermentative charges every vegetable matter or filth, which is incapable of vinous fermentation, and is prone to the putrefactive: For they are well aware that the putrescent matter tends to make the vinous fermentation tardy and sluggish, and to give a taint which passes from the beverage to the distilled spirit. In like manner the manufacturer of spirit from the saccharine wash of the boiling-house, endeavours, by skimming and subsidence, to free the sweet from the putrescent herbaceous and filthy scums, previous to the setting for fermentation, and afterwards throughout the process. But as the depuration by these ordinary means is very far from being perfect, and as it is the

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nature of the saccharine juice itself to generate some acetous acid along with the spirit in the fermentation, the product from the fermented charge is of the vilest kind; for the spirit is not only charged with acetous ether and the essential oil peculiar to this sweet, but with the tainting and oily products of the putrescent filth.

"But as it is the nature of molasses to generate less acid relatively to the spirit in fermentation; and as much less of the putrescent matter above mentioned accompanies this sweet in the fermentable charges; especially when they are made without any wash from the boiling-house, and without any dunder or refuse of a former distillation; the spirituous product in distillation differs from that last mentioned, as much as it differs from malt spirit, and is highly preferable in smell and taste. It demands the name of *molasses spirit*, to distinguish it from the spirituous product of the ordinary mixtures of boiling-house wash and molasses, with or without dunder, to which the name *Rum* is to be confined.

"As the melioration of these, like all other spirituous liquors, by long keeping, depends on the escape of the offensive oily and ethereal parts, which sooner than the alkohol penetrate and pervade wooden vessels; our first advices for the improvement of the manufacture are to show how it is to be uniformly productive of the utmost quantity of spirit, divested of the nauseous and depreciating ingredients, so far at least as to be capable of acquiring, in a short time, the flavour and value of good old rum, with the least loss of spirit by transpiration; and to be highly preferable, even when recent from the still, to any new rum of the ordinary process."

To this account are added threescore practical sentences, very judicious, but too long for transcribing.

It was to be hoped that this employment of time and talent by Dr. H. in favour of his patrons, would have answered at least all their moderate and reasonable expectations. And we do not know that this is not the fact. But one thing we know, that the New-York market, which receives annually about three thousand puncheons of Jamaica rum and spirits, contains, *as yet*, no evidence of improvement in their quality. The wholesale grocers and spirit-dealers are not sensible of any improvement in the article which is brought there. They who have been long in the trade, declare that rum now comes to them just as it formerly used to do, in some years better and others worse, according as the season brings forward the crops; from some plantations good, and from adjoining ones

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bad, in proportion to the pains taken in the preparation. The flavour is *piny*, *smoky* or *fiery*, as *tar* prevails in the cisterns, *empyreuma* happens in the stills, or *ether* is produced in either place; very much as was formerly the case. It is still found necessary to leave the stored puncheons three or four years with their bungs out, to give their contents the quality of "old Jamaica spirits." And this, when done, is always accompanied with a great lowering of the proof, and with loss, averaging, as some have reported, one per cent. a month by evaporation, independent of leakage. Hence the greater part is consumed before it acquires such a respectable and mellow age.

Though this account appears rather unfavourable to Dr. H.'s system of management in the preparation of sugar and rum, we entertain a confidence he will not be disappointed or discouraged, but that both these branches of manufacture will be ultimately improved by his skilful exertions.

ART. IV. *Practical Observations on Vaccination, or Inoculation for the Cow-Pock. By* John Redman Coxe, *M. D. Member of the American Philosophical Society, and one of the Physicians to the Pennsylvania Hospital.* 8vo. pp. 152. *Embellished with a coloured Engraving. Philadelphia.* J. Humphreys. 1802.

THE respectable author of this work is one of those who have taken laudable pains to introduce the inoculation of the cow-pock into the United States, to remove the difficulties which opposed its reception and progress, and to correct the misstatements which ignorance or a mischievous disposition have circulated in the community. He seems duly to appreciate the value of the discovery, and endeavours, with a zealous and benevolent warmth, to recommend this safe and easy substitute for the small-pox.

Most of the leading facts and principles concerning the cow-pock, known and ascertained at the time, are noticed in this publication. The author states the circumstances of the Jennerian discovery, and does full justice to the merit of that eminent benefactor of mankind. He seems to agree with Dr. Jenner in thinking that the infection of the cow-pock was originally derived from the *grease* in horses, and presents some of the more striking facts which have been adduced by different persons in support of that opinion. A history of the disease

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follows in the next place, in which he first delivers the ordinary and regular concourse and succession of symptoms from the commencement to the termination of it, and afterwards such irregularities as are observed most frequently to occur.

Much discussion and difference of opinion have arisen on the question, how late in the disease it may be allowed to take matter for the purpose of inoculation? The author cannot entirely agree with the illustrious discoverer, who enjoins it upon inoculators to consider the appearance of the efflorescence as a sacred boundary which ought not to be transgressed. He is rather inclined to believe, that while the fluid in the vesicle continues limpid, and the scab is not too far advanced, no inconvenience will arise from the use of the matter. And, on the whole, as a general rule, he thinks it best to select a point of time, beyond which the matter is not ordinarily to be taken; this time he supposes may properly be eight times twenty-four hours.

It is important to consider the means of preserving and transmitting the matter of this disease, as it is so small in quantity, so delicate and perishable. Dr. C. mentions the various modes adopted for this purpose, but gives the preference to the preservation of the matter between two plates of glass.

After these discussions, Dr. C. proceeds to offer a summary view of the evidence in favour of the prophylactic powers of the cow-pock against the small-pox. But in this it would be unnecessary to follow him, as we are persuaded that none of our readers at the present day can doubt that body of testimony on this subject which has been long since and repeatedly laid before the public.

Dr. C. advises not to consider the vaccine as a preservation against the small-pox, before it has completed its action on the system, which, he believes, is seldom before the ninth or tenth day. He adduces several cases of the union of the two diseases, of the co-existence of measles and cow-pock, of cow-pock and scarlatina anginosa, and of small-pox, measles and hooping-cough. Hence he infers strong proof of the possibility of two different diseases existing in the system together; a conclusion which is adverse to the generally prevailing doctrine of the present day.

The *spurious disease*, which has so often injured the credit of the cow-pock with the undiscerning and uninformed, is in the next place traced to its sources, and described in such a manner as will always secure the attentive and wary practitioner from this source of deception. The author supposes

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that cases of spurious small-pox occur in a manner analogous to those of cow-pock, and thereby produce the disappointments which physicians sometimes experience in the effects of inoculation. But besides the cases of imperfect or spurious small-pox, he states instances of a second attack of that disease where the first had been characterized by all the essential and unequivocal symptoms. However difficult it may be to explain such cases, they seem to rest on unexceptionable facts.

The effects of vaccination in amending weak constitutions, form a branch of is excellence, which Dr. C. does not omit to exhibit in an advantageous light. He particularly mentions its efficacy in correcting the scrophulous diathesis, in removing certain cutaneous diseases, hooping-cough, deafness, &c.

The comparative view of the vaccine and small-pox is drawn with striking and appropriate features. Truth, indeed, would have justified a more extensive comparison for the purpose of demonstrating the preference due to the former; but enough is said to show the vast superiority of the vaccine over variolous inoculation.

In an appendix the author includes various letters on the subject of the spurious cases of cow-pock, which occurred on its first introduction in New-York, Norfolk, and elsewhere. He also adds a set of tables and notes comprising the outlines of some of the first cases of the cow-pock, which came under his care. And he concludes with sundry remarks and observations on the disease, which occurred after the body of the work had been sent to the press.

We think Dr. C. has collected in this work, and exhibited in a judicious point of view, many of the most material facts concerning the disease in question; and that he deserves the praise of industry, and a well directed zeal in extending the knowledge and practice of one of the most memorable improvements which occurs in the history of the healing art.

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MEDICAL & PHILOSOPHICAL NEWS.

DOMESTIC.

IMPROVEMENTS IN DISTILLING SPIRITUOUS LIQUORS, BY COL. ANDERSON AND MR. KRUFFT.

COLONEL Alexander Anderson's patent for an improved mode of distillation has been the subject of considerable discussion. The Committee of Ways and Means reported an account of it to the House of Representatives, on the 8th of March, 1802; and stated that the distillers could run off their spirits so much more rapidly in this mode than by the old one, that the revenue was evaded, and that to collect it, in case the excises were continued, there would be a necessity to ascertain not merely the *capacity of the still and its head*, but the quantity *actually distilled*.

William Miller, Esq. the Commissioner of the Revenue, collected the facts on this subject from the Supervisor of the district of Pennsylvania, and the Collector of the county of Lancaster, and submitted them to the Secretary of the Treasury, with the following, among other remarks: "I do not find any considerable improvement in the form of the still itself has been attempted. The head and parts connected therewith are materially changed, and the alterations are calculated to answer very valuable purposes to the distiller. By means of the half-globe, which is connected with the still-head, by a pipe of four inches diameter, the capacity of the still is evidently augmented about one third, for which the distiller presumes he is not chargeable with duty. By giving the steam room to ascend, the process may be greatly accelerated without the risque of boiling over and injuring the quality of the spirit.

"The immersion of the half-globe (or condenser as it is called) in the mashing tub, for the purpose of heating the wash, saves much time, as it would be impracticable to bring a still to boil, in the ordinary way, in less than half an hour.

"As there is no unusual waste of material, nor an increased consumption of fuel, distillers must be great gainers by the new mode, provided they are established in a plentiful country, or where they meet with few impediments in obtaining supplies of grain."

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We observe also a method of distilling, advertised by Mr. Michael Krufft, of Morrisville, in Pennsylvania. It is stated that he can, without forcing the still, work off fifty charges in 24 hours; that the spirit will be equal in quality, and greater in quantity than that produced in the old stills; that the expense in labour and fuel will not exceed one fourth, and that in this new construction there is no possibility of driving off the head, by which accident unskilful persons have heretofore sustained considerable injury.

PROVISION FOR MARINE HOSPITALS, AND FOR THE RELIEF OF SICK AND DISABLED AMERICAN SEAMEN.

By an act of Congress, passed July 16, 1798, a tax of twenty cents per month was laid upon all seamen in the merchant service of the United States arriving from foreign ports, during the whole time of their employment on board since the last entry of the ship; also, a like sum of twenty cents a month was ordered to be collected from every seaman in the domestic coasting trade, for such times as the seamen were in service. And these sums are deducted by the masters or owners from the sailor's wages, and paid to the collectors of the impost at the several ports of entry, who account for the same, quarterly, at the treasury.

By a subsequent act, passed March 2, 1799, the seamen of the navy of the United States were subjected to a similar tax, and the Secretary of the Navy authorized to deduct twenty cents a month from the pay of the officers, seamen and marines, and account for the same at the treasury, as the collectors do.

From these three sources a fund for the relief of sick and disabled seamen is derived. The sum total of this fund, as far as returns had been made on Feb. 16, 1802, amounted, including the monies collected both in private and public service, to 154,583 dollars.

The ports where hospitals have been established, or temporary relief afforded to seamen, are—

1st. Boston, Newport, Norfolk, and Charleston (S. C.), where marine hospitals have been established wholly under the laws of Congress, solely supported by the seamen's fund, and destined peculiarly for their accommodation: that at Newport has been some time ago discontinued. At Gosport, near Norfolk, an hospital was purchased of the State of Virginia, out of the navy fund. And an appropriation out of the or-

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dinary seamen's fund has been made for the erection of a marine hospital in Boston.

2. Baltimore, where the funds are altogether derived from the same source; but the management of the sick is under the direction of the city board of health.

3. New-York and Philadelphia, where seamen are received at the hospitals already established for internal and charitable purposes. At these places they receive the same medical and chirurgical aid as the other patients do, and the like nursing, food and attendance. For their board, &c. a fixed weekly sum is paid out of the marine fund.

4. Portland, New-London, Wilmington (N.C.), Newbern, Edenton, and, latterly, Newport and Alexandria, where there are no hospitals, but where temporary relief is provided in private boarding-houses.

5. Some provision has likewise been made at Savannah.

It was directed, in the first law on the subject, that the monies collected within any one district *should be expended within the same.* It was afterwards enacted, that (excepting the New-England States of New-Hampshire, Massachusetts, Rhode-Island and Connecticut) the money of the seamen's fund might be expended in the *States adjoining the States in which the same should have been collected.* And during the session 1801—2, the whole of the fund was *consolidated* and *generalized*, so that the surplus of the unexpended money, at any one port or place of collection, may now be appropriated for the relief of seamen at any other place where there is a deficiency. This last regulation was adopted principally on account of increased expenses beyond the amount of the fund heretofore collected in the hospitals of Newport, Norfolk and Charleston, and beyond the amount of the *navy fund*, which, in addition to the other, was applied to these three places exclusively.

On account of the increasing transportation of produce on the Mississippi, an additional number of American seamen and boatmen find a rendezvous at New-Orleans. Many of these, from the Ohio and the upper country, as well as from the Atlantic ports and the ocean, have died annually, in the most forlorn condition, at that place. These considerations induced the government, by a wise and humane provision, to adopt measures for the support of a hospital in that city for their relief, and to ask permission of the Spanish government to establish the same.

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IMPROVEMENT IN NAVAL ECONOMY.

Some time last winter, means were adopted in the navy department for keeping the public ships free from nuisances, and in a sweet and wholesome condition, by means of alkalies. A fair opportunity offered of carrying this plan into operation, on board the frigates employed on the Mediterranean service. Dr. George Davis was charged with the making of proper experiments upon the efficacy of pearl-ash, barilla and lime, in the ship Chesapeake, in which he sailed. Since his arrival on the Barbary station, Mr. Davis has been directed to perform the duties of fleet surgeon until the existing disputes shall be reconciled. In this capacity he has persevered in the use of those purifying substances, with all the advantages that had been anticipated from their operation. A continuance of health has been the consequence of this cheap, easy and efficacious mode of keeping the interior of ships perfectly clean. (The particulars may be read in our vol. v. p. 455—8.)

FAILURE OF THE EXPEDITION TO LAKE SUPERIOR.

Travellers have related that there are vast beds of native copper, and copper ores of great value, on the south side of Lake Superior, within the territory of the United States. For the purpose of inquiring into the facts and circumstances of these valuable minerals, a resolution of the two Houses of Congress was passed on the 16th April, 1800, authorizing the President of the United States to employ an agent to collect all material information relative thereto, to inquire whether the Indian title was extinct, and ascertain on what terms the mines might be purchased for the government. The agent was instructed to accomplish his mission, and make report soon enough to be laid before Congress at their next session. The next session began on the 17th day of November ensuing, and ended on March 3d, 1801.

The President did appoint an agent, but his commission was not made out until September 24, 1800. And no report having been made to Congress during the prescribed time, the Attorney-General wrote to the agent, who had not yet set off, on the 30th March, 1801, that the President wished to suspend the prosecution of the business, and directed him not to proceed, but to make report of his arrangements, expense incurred, &c. and be ready to account for the sum of one thousand dollars advanced from the treasury for the mission.

Thus this voyage to the north-west fell through: yet, while it is admitted to be right to stay the commencement of expenditure of public money, after the resolution authoriz-

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ing it had expired, yet it is a matter of regret, that, through delay and procrastination, so fair an opportunity was lost of exploring that frontier of the United States.

The history of these proceedings may be seen in a message of the President of the United States to the House of Representatives, dated March 31, 1802, sent pursuant to a resolution of the House on the 23d.

NEW AMERICAN METAL.

It is stated in several English publications, that Mr. Hatchett has discovered a new metal in an ore lately brought from North-America. This he has distinguished by the name of *Columbium*, significant of the country whence it was derived. We have no particular information from what spot or region the mineral was procured.

RATION OF AN AMERICAN SEAMAN.

The navy ration for the mariners on board the armed ships of the United States, was fixed by an act of Congress for providing for a naval armament, on July 1, 1797:—On Sunday, one pound of bread, one pound and an half of beef, and half a pint of rice: on Monday, one pound of bread, one pound of pork, half a pint of pease or beans, and four ounces of cheese: Tuesday, one pound of bread, one pound and a half of beef, and one pound of potatoes or turnips and pudding: Wednesday, one pound of bread, two ounces of butter, or, in lieu thereof, six ounces of molasses, four ounces of cheese, and half a pint of rice: Thursday, one pound of bread, one pound of pork, and half a pint of pease or beans: Friday, one pound of bread, one pound of salt fish, two ounces of butter or one gill of oil, and one pound of potatoes: Saturday, one pound of bread, one pound of pork, half a pint of pease or beans, and four ounces of cheese: and also an allowance of one half pint of distilled spirits per day, or, in lieu thereof, one quart of beer per day to each ration.

For the peace establishment, the ration was altered as follows, by a law passed March 3d, 1801:—Sunday, fourteen ounces of bread, one and a quarter pound of beef, half pound flour, quarter pound suet, half pint distilled spirits: Monday, fourteen ounces bread, one pound pork, half pint pease, half pint spirits: Tuesday, fourteen ounces bread, one pound beef, two ounces cheese, half pint spirits: Wednesday, fourteen ounces bread, one pound pork, half pint rice, half pint spirits: Thursday, the same as for Sunday: Friday, fourteen ounces bread, four ounces cheese, two ounces butter, half pint rice, half

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pint molasses, and half pint spirits: Saturday, fourteen ounces bread, one pound pork, half pint pease, half pint vinegar, half pint spirits. (For the soldier's ration, see Med. Rep. vol. v. p. 90.)

PLATINA FROM THE MINES OF CHACO, IN TERRA FIRMA.

Three hundred pounds of platina were imported into New-York in October, 1802, from the Island of Jamaica. But it was not a native production of that place. It was brought from the continental dominions of Spain. As the exportation of platina is prohibited by the government, this quantity was smuggled off in small parcels. In the course of certain secret mercantile transactions, these different collections found their way from the Spaniards to a British subject, who brought to this market the above-mentioned quantity, which is but a part of what he had gathered together.

Such a quantity of the rarest of the metals, and of one which is believed to be peculiar to America, and known to Europe only about the middle of the eighteenth century, afforded an excellent opportunity of examining its condition when offered for sale as an article of commerce. Dr. Mitchill, to whom a sample was sent, and who was requested to look at it, described it thus:—This platina consisted principally of small grains, smooth to the touch, somewhat similar to flax-seed, and rather flat than round. The size of these grains was considerably larger than the coarse raspings of iron, and they were more irregular and varied in their shape. Some pieces, however, were much bigger, and there was one in particular of the size of a middling bean. The colour was midway between silver and iron; though the native metal, as it lay exposed to the eye, brought to mind a resemblance, though by no means an exact one, to filings of silver and powder of tin. The grains were less angular and shining than the former, and not so dark and globular as the latter. A portion of iron was mixed with the platina; for, on applying the magnet, numerous particles of a dusky hue adhered to it; and even many pieces of platina, known by their whitish complexion, were attracted by the load-stone. Pieces of galena, mingled with pyrites, were found mixed with it in the bags. There was also a mixture of earth and sand. The grains of platina were easily capable of extension between the anvil and hammer, and showed neither rust nor tarnish. There did not appear to be any quick-silver mixed with it.

Baron Carendeffez has subjected parcels of this platina to a

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great many experiments, which he intends to publish at large. In the mean time it will gratify our scientific readers to learn, that he has found two hundred and eighty-eight grains of this platina to consist of the following parts:

Carbure of iron	56 *grs.*
Silicious or quartzy sand	12
Magnetical iron	40
Gold grains or dust	1
Pure platina	179

which is considerably more than one-third of foreign ingredients; and the whole of these, except the trifling portion of gold, of no value.

The mines in the Island of *Chaco* afforded it: These are in Terra Firma, about three hundred miles up the River Magdalena, and south-west some distance from Santa Fe, and are reckoned among the most pure and productive in America. The platina is found among the gold, and the grains of the two metals are washed from the sands together, and afterwards separated. All the platina, as well as all the gold, is deposited in the adjoining custom-house, and kept by the king's officers. It is not certainly known what becomes of the platina. For though it is reported that the policy of the government directs it to be thrown away, and committed to the currents of deep rivers, yet there is a belief that the whole quantity collected is transported to Spain. All commerce in platina is forbidden under penalty of death: consequently none can be procured but by smuggling, and at very great risk. The first cost, fees to assistants, and extraordinary hazards in this contraband trade, amounted to so much, that the owner of this parcel said it stood him in forty dollars a pound.

In respect to the proportion or quantity of the platina found, it is ascertained to be at least ten times as scarce as gold: that is, when the grains of one are separated from those of the other, there are only about from *eight* to *ten* ounces of platina for *one hundred* of gold. Hence, if ever the policy of nations should admit it among the precious metals for coining into money, platina would be ten times as valuable, weight for weight, as gold. In other words, a coined piece of platina, of the same weight with an eagle of the American mint, would be worth one hundred dollars.

MINERAL SPRING NEAR PASSAICK FALLS.

At Aquacanonk, in Essex county, East-Jersey, now called the township of Patterson, a mineral spring, called Blachly's

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Bath, has, of late, attracted some share of public attention. It breaks out of the loamy or gravelly soil of a tract of country abounding in silicious sand-stone or free-stone, distant four miles and one half from Passaick Falls, two miles from Aquacanonk Church, nine miles from Newark, and about thirteen miles from the city of New-York.

The spring is believed to be a chalybeate, and deposits an ochreous sediment upon all bodies over which it flows. This ferruginous deposition is a brown oxyd of iron. The water is so charged with the particles of this metal, that it strikes a purple or dark colour with infusions of tea, galls, and other astringent substances. Its other chemical qualities are not, as yet, so fully known as could be wished, though it is supposed to abound with carbonic acid.

This mineral spring is very cold, and sensibly more so than another spring of common water which bursts out within the distance of a rod. It yields a quantity of water, equal, by estimation, to the filling a conduit of an inch in diameter, and has never been known to freeze.

It may be drunk in large draughts, without inducing oppression or inconvenience. Though freely and copiously swallowed, it does not overload the stomach, nor produce any of the symptoms of refrigeration. In some of those who begin to drink it, it has operated a few times as a gentle emetic. Upon others it has produced a moderate laxative operation. But its chief effect, and that by which it is more particularly distinguished, is as a diuretic. By the kidneys it passes off largely, and remarkably increases the discharge of urine. They who have tried its efficacy likewise relate, that the perspiration is promoted by it, and that there is a more free and easy outlet of the fluids destined to pass off through the pores of the skin. Under its influence, they remark that the appetite for food is generally much increased, that the pulses are raised, and that there is frequently a pleasant excitement or exhiliration.

They also state, that in inflammations of the eyes, in ringworms, and in various other eruptions of the skin, it has done important service, as well as in cases of gravel, rheumatism, and obstructions of the abdominal viscera and alimentary canal.

The probable elevation of the spring is sixty feet above the level of Passaick River. Its situation is an open plain, surrounded by a country very healthy, moderately elevated, and finely diversified by hills and dales.

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RARE AND INSTRUCTIVE AMERICAN MAPS.

Many of the events of the revolutionary war are perpetuated on the maps published by the British commanders, for explaining their operations and campaigns to their government. Some others of much value were made out before the revolution. We offer the titles of several of the more uncommon ones which we have lately examined, and which are of great value to the American statesman, engineer and historian.

1. Evans's map of the middle Provinces, accompanied with an explanatory pamphlet. At present the particular value of this is derived from the Indian names and the names of old forts and stations which are preserved on it, illustrative of the settlements of the French on the frontiers, and of the contests with them and their allies.

2. A map of the city of New-York and its environs, dedicated to Sir Henry Moore, baronet. It was done by lieutenant B. Ratzer, of the king's 60th or royal American regiment, and published by Faden and Jeffreys, of London, in 1776. It is an handsome and correct piece of work, and affords an agreeable retrospect of the state of things in and around this great capital at that time. This map includes all the space on Long-Island, York-Island, and the Jersey shore, between the latitudes of Blackwell's Island and Bucking Island.

3. A sketch of the operations of his majesty's fleet and army under the command of vice-admiral the Right Honorable Lord Viscount Howe, and General Sir William Howe, K. B. in 1776. This map is two feet eight inches by two feet, and was published by J. F. W. Des Barres, Esq. of London, in 1777. From S. to N. it comprehends all the space from the south of Sandy-Hook to the entrance of the Highlands, N. of Haverstraw-Bay, and between E. and W. it includes the country from beyond Cow-Bay, on Long-Island, and Mamaroneck on the main, in New-York, to Brunswick, Amboy, Woodbridge, Rahway, &c. and the tracts west of South River and the upper streams of the Raritan, the Passaick and the Rampogh, in New-Jersey. On this are strongly delineated the landing of the British troops in 1776, and all the subsequent proceedings of the fleet and army which distinguished that memorable year.

4. A small but instructive map of Major Holland's was also published by Des Barres in 1779, containing a plan of Fort Montgomery, and Fort Clinton, taken by his majesty's forces under the command of Major-General Sir Henry Clinton, K. B. This contains a view of Coplop's Kill, and the two forts on its

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sides, opposite to the mountain called St. Anthony's Nose in the Highlands, with a sketch of the Hudson from St. Anthony's Nose towards Robinson's landing.

5. That part of Hudson's river which shows the positions of Fort Montgomery and Fort Clinton, with the cheveux de frize, cables, chains, &c. to obstruct the passage of his majesty's forces up the river, was delineated by Lieutenant John Knight, of the Royal Navy, in 1777, and published in connection with the preceding map also by Des Barres. This includes the whole tract of the Hudson's passage through the mountains, from *Peekskill* to *Newburgh*, with the depths of water all along from St. Anthony's Nose to Polipus (Pollepels') Island.

6. The maps accompanying General Burgoyne's vindication of his conduct, published in England after the convention of Saratoga, are very instructive, and highly worthy of perusal. Some of the best of these, particularly that of the route across the Lakes, were done, as we have learned, by Simon Metcalfe. And we mention this to give them greater credit, as being the result of actual survey by a skilful hand.

7. An handsome little map was published by Jeffreys, in 1760, of the city of Quebec, and its environs, as it surrendered to the British fleet and army on the 18th September, 1759, to Vice-Admiral Saunders and Brigadier-General Townshend. This gives a clear prospect of the condition of things in that eventful quarter at that time.

With these maps before him, the reader of American history can examine the local circumstances of the principal military and revolutionary events that have passed between Sandy-Hook and the capital of Lower Canada.

8. Henry Mouzon and others published a very large map of North and South Carolinas, from actual survey, in 1775. It was printed by Sayer and Bennett, London. Its length is four feet nine inches, and its breadth three feet four inches. On it may be seen the mountains, rivers, swamps, marshes, bays, creeks, harbours, and banks and soundings on the coasts, with the roads and Indian paths, as well as the boundaries of provincial lines, townships and other divisions of the land in both the Provinces, as they existed or were understood at that time.

FOSSIL SHELLS OF LONG-ISLAND.

In digging down the bank of the Navy Yard at the Wallabout, a stratum of marine shells has been found about twenty-five feet below the level of the soil. Among them was found a petrified oyster in fine preservation. This discovery corres-

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ponds with the fact observed by the persons who dug the uncommon deep well on Brooklyn heights, within the fort erected there by the British, towards the close of the revolutionary war. Shells were found in digging this well, which were probably from this very stratum, extending from the adjacent Navy Yard. At Newtown shells have also been found at considerable distances below the surface, by the diggers of wells; and the like has been repeatedly observed on that island, especially toward its western end.

It is a remarkable fact that though the rocks in the maritime parts of the State of New-York are granitical and magnesian, and belong to the ancient order of things, and are part of the primitive class of terrestrial substances, yet the sandy, loamy, and gravelly strata are all horizontally disposed, and have the strongest evidence of having been superinduced in the course of ages by water. Every place which has been undermined by the ocean, or in the progress of improvement dug down by the hand of man, shows a stratification almost as regular as a level could make it, and the frequent occurrence of these animal relicks renders the matter independent of conjecture.

REMARKABLE ANTISEPTIC POWER OF CARBONATE OF SODA.

Muriate of soda is the common material employed for keeping off putrefaction from animal substances, particularly such as are intended for human food. The reason of this was stated in our vol. ii. p. 279. Carbonate of soda is still more powerful in antiseptic virtue. Twelve months ago Dr. Mitchill salted a piece of lean beef with powdered and undissolved carbonate of soda; from that time it has lain undisturbed in a wooden box, sustaining the heat of intervening summer. It has become very dry, has shrunk and lost much of its weight, and is at the same time so firm that its strong and adhering fibres require to be separated from each other by stout pulling. Not the least sign of taint or corruption has been discernible from the beginning, and it now looks as if it would keep for a century. It resembles almost exactly the flesh preserved by Dean Hamilton in pot-ash, as related in our vol. i. p. 179; and it corroborates the evidence given in favour of its antiseptic virtue by the ancients, as stated in our vol. iv. p. 96. To all which passages we invite the attention of our readers.

MEDICAL GRADUATION AT DARTMOUTH COLLEGE, (N. H.)

The degree of bachelor of Medicine was conferred on three candidates at the commencement held on July 21, 1802. These,

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with the dissertations read and defended by them, are as follow, to wit:

DANIEL OSGOOD,	On Consumption,
CYRUS PERKINS,	On Fever, and
JONATHAN H. SPARHAWK,	On Hemorrhagy.

MURIATE AND SULPHATE OF SODA MANUFACTURED IN MASSACHUSETTS.

At Dennis, in the county of Barnstable, common salt is crystallized from ocean water, without culinary heat or boiling, in considerable quantity. The amount is stated at twenty thousand bushels a year of domestic sea salt. This is estimated at one-fifth of the quantity consumed in the Cape Cod fishery, annually, which is reckoned to be one hundred thousand bushels. It is stated to be excellent in purity, whiteness and weight. It resembles the first quality of Isle of May salt, and is as heavy as eighty pounds the bushel. Great improvements have been made in cheapening the erection of the works and in abridging the performance of labour. At the same place Glauber's salt is prepared in large quantities, to the amount it is believed of fifty tons per annum. It may be made there equal to any in the world, and abundant enough for the whole home market and the West-India Islands.

It is expected that both epsom salt and magnesia will be prepared from the bittern, as soon as the manufacture is a little further advanced, and the artists shall have had further time to gain practical skill by experience.

Observations on the new Planet, discovered by Mr. Olbers, of Bremen; and of the Opposition of Ceres, the Planet discovered before by Mr. Piazzi.

A conjecture as easy to make as useless to the progress of astronomy, had raised a presumption that a planet existed in the wide space between Mars and Jupiter; but the law which had been imagined to prevail being founded upon the relative distances of the planets hitherto known, no sooner seemed to be verified by the discovery of Mr. Piazzi's planet, than it was contradicted in the most formal manner, by the discovery of a second new planet, very near to the first. This is an instance of the overturning of opinions, grounded merely upon deceitful analogies, and on the false ideas we entertain of what ought to be denominated regularity and order in the designs of nature.

The new star, to which we allude, presents a very singular spectacle, entirely contradictory of the systems that had been

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conceived to explain the formation of the planets, by virtue of a cause which seemed to have confined their orbits to the narrow zone called the Zodiac. The great inclination of this planet's orbit obliges us to enlarge considerably the width of the Zodiac, and gives us reason to believe that there may possibly be no limits to it. These reflections are deduced from the following facts, established by Mr. Delambre.

On the 20th Germinal, Mr. Burckhardt having been informed that Mr. Olbers, of Bremen, had discovered a new star which had the appearance of a planet, he communicated it the same evening to all the Astronomers of the National Institute of Paris, who looked for the star the night following. The next day Mr. Messier, Mr. Mechain, and Mr. Delambre, reported an account of their observations. The new star had a very perceptible motion, as well in right ascension as in declination. It had no appearance of a tail, nor even of nebulosity; nor was there any thing but its motion to distinguish it from the stars of the *eighth* magnitude, in whose neighbourhood it was visible. The observations on it have been continued at the meridian until near the end of Floreal. It always presented the same appearances, except that its light was more faint toward the latter part of her time, on account of its receding from the earth.

Unsuccessful efforts have been made to find a parabola which coincides with the observations. The circle has not suited at all better. It must be an ellipsis, and indeed a very eccentric one. In this respect the new planet does not differ much from Mercury; but what is more extraordinary is that its inclination is about 35 deg. while that of Mercury is only 7, and that of the planet *Ceres*, discovered in 1801, by Mr. Piazzi, is 10 deg. 37 min. On this account the *Zodiac* must be considerably enlarged, if we continue to distinguish by that name the zone in the heavens, in which *all* the planets perform their revolutions.

Another very remarkable peculiarity is that the mean distance of this planet differs very little from that of Ceres. There is no instance known in the Solar System, of two planets whose orbits approach each other so nearly.

So many singular phenomena render this planet uncommonly interesting to Astronomers. It is, however, so small that it can have no sensible influence on the neighbouring planets. On the contrary, it may be presumed, that it suffers very considerable perturbations from Jupiter. Mr. Burckhardt has kept an account of the principal ones, for the sake of determining an elliptical orbit. Indeed we have great need of a

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tolerably exact theory, in order to find this planet again after it shall emerge from the solar rays, in which it is about to be plunged. Without such a theory, it would be hard to find it on account of its extreme littleness. It is very probable that it would have remained a much longer time unknown, if it had not been discovered precisely in the place which had been left by Ceres, and exactly among the stars which the Astronomers had observed, with so much exactness, for several months past. It is a curious reunion that has happened to the three planets, by which Astronomy has been enriched in our days, that they have all been seen to pass the meridian within a few minutes of time. Mr. Olbers has given to his planet the name of *Pallas*.

The perfection of instruments and of modes of observation have enabled the Astronomers of our day to determine from a few observations, the outlines of the planetary orbits, which formerly they were obliged to leave for future ages to settle. No sooner was one of these planets discovered than its motion was calculated with remarkable precision. By this, the opposition of *Ceres* (Mr. Piazzi's planet) has been proved, from observations made at the Military School by La Lande, his nephew, and Bruckhardt.

The time of its opposition was the 26th Ventose, tenth year (March 17th, 1802), at 3 hrs. 46 min. and 8 sec. mean time of the observatory at Paris. The true longitude, free from the effects of aberration, nutation and parallax, was 176 deg. 21 min. 26 sec. 5. The Geocentric latitude, north 17 deg. 7 min. 57 sec. 5. (Lacroix. Notice des Travaux, &c.)

Mr. Herschell purposes to distinguish these celestial bodies for the present, by the term "Asteroids."

Guyton's Rejection of Nitrous Fumigation to destroy the Infection of Air and Contagion; and his Recommendation of oxygenated Muriatic Acid Gas instead of it. (Uter horum pejor?)

It is curious to trace the vagaries of science. Upon one of the plainest and commonest processes, to wit, that of rendering nasty bodies neat and clean, there has been an uncommon parade of chemical conjecture and experiment, and the more philosophical and learned the projectors are, the wider they seem to wander from the mark. Every chamber-maid and washer-woman knows how to destroy infection and its poison by soap-suds, alkaline ley, and lime-water; but it is reserved for great geniuses alone to effect the destruction of them by

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smoking with acid vapours. It is a great pity that in these matters philosophy is wholly at variance with the common experience of mankind.

In the month of June, 1802, R. HALL, M. D. translated from the French Mr. GUYTON MORVEAUX's *Treatise on the Means of purifying infected Air, of preventing Contagion, and arresting its Progress.* It was published by T. Hurst, in London, in a small 8vo. volume of 248 pages. His mode consists in employing muriatic acid gas, according to the following receipt, which will render every individual capable of performing the process of fumigation, (p. 240.) "No other apparatus is necessary except a bottle of sulphuric acid (oil of vitriol of commerce), a large glass goblet, and some common salt. The goblet being placed on the ground, or on a table in the middle of the room, a large spoonful of the salt must be put into it, and a very small *liqueur* glass-full of the acid should be added at three or four different times, with an interval between each time. At every effusion of the acid there will be disengaged and diffused throughout the apartment a quantity of vapour, which will come into contact with the fetid or malignant miasmata without producing any inconvenience to the persons present. When a chamber is to be purified in which a patient has died of a disease supposed to be contagious, or in which bodies in a state of complete putrefaction have been suffered to remain for some time, it will be necessary to double, or even to triple the quantity of the fumigating materials, according to the size of the apartment, to pour the acid in at once, and having retired, not to re-enter the room for some hours." He recommends *acetic* acid, or radical vinegar, as preferable to common vinegar or *acetous* acid, when vinegar is employed; though he thinks it not expensive or active enough for use in the large way, (p. 131, 133). And he proposes a method of making what he calls *extemporaneous oxygenated muriatic* acid, by pouring nitro-muriatic acid, or *aqua regia*, upon the black oxyd of manganese in gross powder (p. 123.), or by mixing with any portion of manganese double its weight of common salt, and then pouring upon them nitric acid or even aqua fortis. (p. 241.)

The most powerful and efficacious anti-contagious agent which he knows, is *the oxygenated muriatic acid gas.* The process for preparing this differs from the ordinary muriatic acid gas already mentioned, only by the addition of a small quantity of black oxyd of manganese (p. 242.) in powder.

The work is divided into *four* parts. Of these the *first* con-

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tains Mr. Guyton's original experiments at Dijon. For an account of which, and for strictures and comments thereon, showing the mistakes in the inferences he drew, we refer to our vol. ii. p. 229, 240. In the *second* he has summed up the experiments made in foreign parts, that is, out of France, with acid fumigations. Among these are included the trials by Dr. Smyth, Mr. Menzies, and others, of which we gave an abstract and critical examination, evincing their inconclusiveness and fallacy, in our vol. ii. p. 232, 233, and in vol. iii. p. 200, 202. The *third* part contains the experiments of Mr. G. and his reasonings on them, concerning the qualities of air confined with pieces of raw beef left to putrefy in it under large receivers. These experiments are only *eleven* in number, and are by no means decisive of any great point on the subject. The celebrated author had originally assumed, "that ammoniac was the vehicle of the fetid miasma" in the church at Dijon; in his experiments (p. 78 and 98) he sought for ammoniacal gas among the products from his putrid beef, *without success;* and thence concludes that it exists in a saponaceous form, and that pure ammoniac, or carbonate of ammoniac (the contagious principle) "is carried into the air in a state of combination anterior to its solution in that fluid, which sufficiently indicates the necessity of turning our attention towards such agents as may be capable of destroying the affinities of this compostion." (p. 99.) He observes, further, that putrefaction is a disoxygenating process; and therefore the true corrective of air vitiated by corruption, is to decompose and neutralize ammoniac while it furnishes oxygen.

Holding this hypothesis invariably in his eye, he exposed air that had been confined with putrid flesh, and grown very fetid, to the action of *benzoin, balsam of Peru, storax* and *myrrh dissolved in alkohol,* and found, what every body would have supposed, that the putrid smell was not overcome. (p. 104.) *Vinegar of the four thieves* modified the putrid smell, but did not destroy it. *Pyroligneous acid* produced a great change at the putrid odour; such an one as all the American country maids have been acquainted with from their infancy of destroying bad smells in every thing about house, by holding them in the smoke. (p. 105.) *Gun-powder* would not *correct* putrid air. (107.) *Vinegar* destroyed the putrid smell. (108, 110.) Strong *sulphureous* acid did not wholly extinguish the putrid scent, though the *sulphuric* did. (p. 112.)

Mr. Guyton gives little comfort to the friends of *nitrous* fumigations, though he admits it to destroy the miasmata. He

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thinks it almost incredible that Dr. Smyth's process, as affirmed by Mr. Keir, should afford *white* vapours, when he could get only *red* ones. (p. 115.) Putrid odour is sometimes perceptible after the application of nitrous vapour. (p. 116.) And the nitrous vapours, universally, instead of giving oxygen to the atmosphere, abstract it. (p. 118.) He even talks of *danger* from them. (p. 143.)

After all these follow the experiments on the oxygenated muriatic acid, which he declares to destroy putrid taints and smells altogether. Morveaux, Vicq-d'Azyr, and Chaptal, all dissuade perfumes and aromatic odours, as affording deceitful security.

After reciting his experiments and observations in favour of the oxygenated muriatic acid, Mr. Guyton has a chapter upon *oxygen*, and another upon *oxygenating* processes and agents. In these he concludes that he has established, beyond the possibility of doubt, "that oxygen, and the substances capable of being used as the vehicles for that principle, in a state favourable to new combinations, really excites the action of life, augments the heat, re-invigorates the powers, awakens the sensibility of the organs, and thus imparts to all the movements, that regularity which preserves order in the different functions of the animal economy." Hence the constitution put in such a state, by this anti-contagious or preservative remedy, counteracts the threatened activity of morbific matter. (p. 191.)

And he concludes with recommending this grand instrument of disinfection, to destroy the virus of plague, and all other contagions. (p. 220, 222.)

Here we behold a contention between the votaries of science, which destroys contagion more completely, "nitrous vapour," or "oxygenated muriatic acid vapour?" Dr. Smyth is positive he is right; and Mr. Guyton is no less certain of the correctness of his own conclusion. For our own parts, we think neither the one nor the other of the projects is positively good or worthy of imitation. At best, they are improper modes of purification, and the question which arises will simply be, not which of the two is the most beneficial, but whether the one or the other does the least injury. The muriatic vapour would seem to do less mischief than the nitrous; though bleachers and experimenters complain much of the inconvenience they suffer from breathing even it.

When will the philosophical gentlemen be convinced that the experience of five hundred years in the genteel house-keeping and domestic economy of Europe, has satisfied all persons

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but themselves, that watery solutions of pot-ash, soda, soap and lime, have, when seasonably and duly applied, never failed to extinguish nastiness, infection and contagion? What need is there of all this apparatus, and of all these books and processes, when the best of possible methods is in daily use already, and only wants to be enlarged upon, and carried vigorously into execution?

PLAN OF THE LECTURES IN THE ROYAL INSTITUTION OF GREAT-BRITAIN.

The colleges and universities having been found to be almost wholly deficient in teaching certain of the most useful of the arts and sciences, a new establishment has been formed, by voluntary subscription, for diffusing necessary and practical knowledge in the various departments of physics. Of this establishment we gave an account in our vol. iii. p. 78. While this new institution is going on with great spirit and vigour, the colleges and universities are scarcely more advanced than they were two or three centuries ago, or when they were founded.

From a "Syllabus of the Course of Lectures on Chemistry," which we have seen, dated January, 1802, we shall give an abstract of what is doing in that royal institution. The lecturer "first" treats of *ponderable* substances. After some discussions on the general logic of science, on the nature of chemistry, on the corpuscular theory, on the powers of repulsion and attraction, on chemical operations and the instruments of experiment, he proceeds to the classification of his objects. He says the *simple* principles at present acknowledged are *forty-two* in number. These are divided into six classes. I. *Permanent gases, possessed of no acid properties.* 1. Oxygen gas. 2. Hydrogen (phlogistous) gas. 3. Nitrogen (septous) gas.—II. *Solid inflammable bodies, having no metallic properties.* 4. Phosphorus. 5. Sulphur. 6. Carbon.—III. *Metals.* 7. Platina. 8. Gold. 9. Silver. 10. Mercury. 11. Copper. 12. Tin. 13. Lead. 14. Iron. 15. Zinc. 16. Antimony. 17. Bismuth. 18. Arsenic. 19. Cobalt. 20. Nickel. 21. Manganese. 22. Tungstein. 23. Ceranium. 24. Molybdœna. 25. Titanium. 26. Tellurium. 27. Chrome.—IV. *Earths.* 28. Silex. 29. Alumine. 30. Zirune. 31. Glucine; to which some have added, 32. *Agustine*, and, 33. *Ittria*.—V. *Fixed alkaline substances.* 34. Pot-ash. 35. Soda. '36. Strontian. 37. Barytes. 38. Lime. 39. Magnesia.—VI. *Undecompused acids.* 40. Muriatic. 41. Fluoric. 42. Boracic.

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These simple bodies are arranged into *binary* compounds in this manner: BINARY COMPOUNDS containing, I. *Oxygen;* forming water with hydrogen; nitric acid, nitrous gas, and nitrous oxyd, with azote; phosphoric and phosphorous acids with phosphorus; sulphuric and sulphureous acids with brimstone; gaseous oxyd of carbon and cabonic acid with charcoal; arsenious and arseniac acids with arsenic; tungstic acid with tungstein; molybdic oxyd and acid with molybdœna; chromic oxyd and acid with chrome; various oxyds with different other metals; and *oxygenated* muriatic acid with that acid. II. Containing *Hydrogen;* such as ammoniac; sulphurated hydrogen and phosphorated hydrogen. III. Containing *Sulphur;* such as metallic ores and sulphurets; hepars, or alkaline sulphures; and sulphurets of phosphorus. IV. Containing the *Metals;* as metallic phosphurets; metallic carburets; binary alloys and amalgams. V. Containing the *Earths;* as of the earths with each other; of the earths with alkalies; and with the simple acids. VI. Containing the *Undecomposable Acids;* such as the compound salts, called the muriates, fluates, and borates, formed by the union of these acids respectively with alkaline salts and earths.

The simple bodies are combined into *ternary, quaternary,* &c. compounds. These the lecturer arranges thus:—I. *Oxyds with bases consisting chiefly of phlogiston and carbon;* such as the light and heavy hydrocarbonates; alkohol; ether; oils fixed and volatile; sugar; resin; wax; gum; tannin, or the tanning principle; the extractive, woody and colouring matters of vegetables. II. *Acids composed chiefly of hydrogen, oxygen and carbon:* such as the acetous, acetic, tartareous, oxalic, citric, malic, gallic, succinic, benzoic, camphoric, suberic, and mucous or saccholactic acids. III. *Oxyds with bases compounded chiefly of septon, phlogiston and carbon;* these are called gelatine, albumin, fibrine, urea and gluten. IV. *Acids composed chiefly of oxygen, septon, phlogiston and carbon;* such as the formic, bombic, laccic, sebacic, uric, prussic, zoonic and lactic acids. V. *Compounds containing earths and alkalies, or metals;* such as the ternary and quaternary alloys of metals; of earths with each other; and of alkalies with earths, in triple and quadruple combinations.

The compound substances made up of these various associations of simple substances, are classed by the lecturer under the following heads:—I. *Saline compounds;* including those

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which contain acids, as all the numerous bodies of neutral salts; those which contain alkalies, as all the soaps; and those which contain oxyds, as the ammoniurets of silver, gold, mercury and copper. II. *Mineral substances;* including the ores and stones, &c. III. *Vegetable substances;* the solid and fluid parts of plants. IV. *Animal substances;* the muscular, fatty, soft, cartilaginous, membranous and bony parts of the animal solids; and the fluid parts, formed of blood, bile, milk, gastric and pancreatic juice, saliva, &c.

All these phenomena the lecturer states to be brought about by chemical action manifesting itself in four ways. 1. By simple combination. 2. By compound combination. 3. By simple decomposition. 4. By complex decomposition. Or, 5. By crystallization.

Then he proceeds to treat, in his "second" part, of *imponderable* substances. These, according to him, are HEAT, LIGHT, ELECTRICITY and GALVANISM. Upon each of these he dilates at considerable length, embracing the leading facts and theories concerning each of those copious and powerful agents.

The lecturer afterwards applies the principles of chemistry to explain and elucidate the arts; and treats successively of agriculture, tanning, bleaching, dying, metallurgy, manufacture of glass and porcelain, preparation of food and drink, and the management of *artificial* heat and light.

The reader will observe that his two great divisions of the objects of chemistry into the *ponderable* and *imponderable*, compels the lecturer to put the doctrines of heat, light, &c. into the rear. This appears very much like an *usteron proteron* arrangement. By throwing the leading, extensive and fundamental history of *caloric* into the latter part of his course, there can scarcely be a doubt of his having made an innovation, not only useless, but prejudicial to those whom he is to instruct. And many of the facts concerning light are so interwoven with those which relate to heat, that they ought, for the same reason, to have a priority in a course of chemical lectures.

For any thing we can imagine to the contrary, he might as well have divided the subjects into *visible* and *invisible*, or into *fusible* and *infusible*, *inflammable* and *uninflammable*, &c. as into "ponderable and imponderable." The distinction is not happy, nor calculated to do any good whatever to science. On the other hand, it seems likely to puzzle and confound.

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Doubt whether the Opinion that Vegetables secrete Oxygenous Air during their Exposure to the Rays of the Sun is well founded.

A series of bold and well-devised experiments has lately been published, in London, by Dr. Woodhouse, who has just returned from a voyage to Europe, on the changes wrought upon atmospherical air by the germination of seeds and by the growth of plants. From these he contends that they do not purify atmospherical air; but whenever they appear to afford oxygenous gas, it is by devouring the coal of carbonic acid gas for food, and leaving its oxygen in the form of pure air. He also has made experiments on the effects produced by the leaves of plants in common air, impregnated with carbonic acid gas, and exposed to solar light; in which cases the carbonic acid disappeared, and the oxygenous gas increased. And from trials made with the fresh leaves of many different plants, exposed to sunshine in pump-water, Schuylkill water, and this latter charged with carbonic acid, he is confirmed in the same conclusion. Dr. Woodhouse denies that vegetables either decompose water, emit oxygen, or absorb azote, as has been some time the fashion to believe. (See Nicholson's Journal.)

NOTICES RESPECTING THE CITY OF HAVANNA.

The Editors being desirous to obtain a summary account of the city of Havanna, in the Island of Cuba, especially of its population, climate, hospitals, &c. have been politely favoured with the following interesting details, by JOHN MORTON, *Esq. late Consul of the United States at that port.*

The city of Havanna is in the latitude of 23 deg. 12 min. N. and longitude 82 deg. 13 min. W. of London. It is the capital of the Island of Cuba, which is from 700 to 800 miles long, and, on an average, about 75 miles broad. The city is situated on a level point of land; is surrounded, on the land and sea-board, by an high wall and ramparts, mounted with cannon; the sea close upon its walls on the western, and the harbour, in the form of an elbow, surrounding it on its northern and eastern parts; there being but three gates or outlets on the land-side, and a small portion of the harbour appropriated to a quay for the lading and unlading of vessels. The north and north-eastern (opposite) sides of the harbour, which is narrow, not admitting more than one vessel to enter at a time, are skirted by the heights of the Morro Castle, and

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the fortifications of the Cavanas, which intercept the course of the sea-breezes, in a great degree, to the parts of the city bordering on the shore.

The streets of Havanna intersect each other at right angles; are narrow, and, it being an exposed garrison town, are mostly unpaved. The houses are generally of two stories height; built of very thick walls, from large quarries of a kind of free-stone which are in the neighbourhood of the city; plastered over both within and without; the apartments large and convenient, with very high ceilings, and flat tiled roofs.

The police of the city, as it respects its cleanliness, is very imperfect; much filth being suffered to collect in the streets, squares, and yards of private dwellings, causing, particularly during the periodical rains, very offensive putrid exhalations. The city is supplied with water, conducted by a canal, from a river at the distance of four or five miles, and which is distributed in the city from fountains erected in the principal squares; but the water most commonly *drank* is rain-water, collected in large cisterns, and which, in dry seasons, becomes, of course, unwholesome.

The average degree of summer heat on low grounds, those of the Havanna, for instance, is from 80 to 84 degrees. It very seldom rises higher than 86 or 88 degrees.

The winter degrees (for there is very little of autumnal and vernal seasons) are from 65 to 70. I never knew the mercury to fall below 45. The hot months may be reckoned from the 1st of *April* to the 1st of *December;* the remaining months being properly termed temperate: but the seasons, as on our continent, have, in that respect, of late years, considerably varied.

The epidemical disease (the fever of the climate, commonly called the yellow fever) is confined almost entirely to the towns on the sea-board. It generally begins to prevail with most violence about the beginning of July, and continues throughout November. As in all warm climates, it affects strangers mostly; but, during the past season, it existed also greatly among the natives. It is certainly increased in time of war, from the additional number of strangers, sea and land forces; but of its *locality,* I never, during a three years' residence, had a *shadow* of a doubt. If I had had any at first, they would have been dissipated by a thousand convincing proofs which occurred. It never was denied, in my conversations with the intelligent and liberal minded natives. They invariably spoke of the disease as we do of the small-

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pox, measles, &c. as one with which they must naturally be infected at least *once in their lives*. The celebrated XIMENES (known throughout Spanish America), when he attended me at the Havanna, in the summer of 1800, told me I was attacked by the fever *of the country*, termed the *yellow* fever; and, in repeated conversations, clearly and distinctly explained it as *originating* in the country, and not from any *foreign*, but from positive *local* causes. On my last return to the Havanna, he had set out on travels through Spanish America, by command, and in the employ of his majesty, to make useful discoveries in that region; I should otherwise have obtained from him a statement, in writing, of his opinions, and of facts which he had collected and established. I still hope, however, to procure them. The paucity of other scientific characters in that quarter is too generally known to be here further asserted.

The ravages which the yellow fever particularly made, of late years, among the American seamen and other visitants at the Havanna, were occasioned by their fatiguing labours under the continual heat—the unfavourable situation of the *harbour* for coolness—their exposing themselves, after such heating, to the night air and dews—and to their intemperate living.

In those warm latitudes, the sea breeze, or *trade wind*, sets in every day about 10 o'clock A. M. continuing till near sunset; when the land breeze as invariably commences, and, continuing till about seven in the morning, renders the night cool: hence the hottest part of the twenty-four hours is during the cessation of both winds, from seven to ten in the forenoon.

The rainy season commences generally about the middle of May, in the upland country, over the centre of the island, and at the beginning or middle of June in the low country, and continues some years to the end of October; but it has, of late years, varied much as to its commencement. The rains set in daily, during the season, about 2 o clock P. M. descend in torrents, and often accompanied by the most awful and continual flashes of lightning, and peals of thunder. They fall in repeated showers, and in such quantities, that I have known the streets and public squares, in the space of thirty minutes, to have been rendered nearly impassable. The intense heat which immediately succeeds those showers, and continuing generally for the space of half an hour, till a new gust arises or is collecting, often renders respiration difficult, and produces or increases the epidemical diseases incidental to the climate.

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The dry and temperate season is from November until May and June; and, with the interruption only of occasional northerly bleak winds (those seldom), coming over from the American continent, is, in the highest degree, mild and salubrious. No frost is experienced but on the summits of the highest hills and mountains. Eternal verdure pervades the face of the country, and an uninterrupted succession of the finest productions of the earth is offered to its cultivators.

The whole number of inhabitants of the city and suburbs of Havanna, I have estimated, from the best information I could collect (for there has been no regular census ever published) at 70,000; 45,000 being within, and 25,000 without the walls—a *proportion* confirmed by the number of births in the two districts.

An Account of the Number of Births, Marriages and Deaths in the City of Havanna, and its Suburbs, in the Island of Cuba, from January 1 to December 31, 1801, as collected from the Returns of the different Parishes.

PARISHES.	Births.	Marriages	Deaths.
Sagrario (Sanctuary) of the Holy Cathedral Church,	531	90	214
Espiritu Santo,	984	199	408
St. Cristoval,	615	105	212
Santo Angel,	481	97	156
SUBURBS, or without the Walls.			
Neustra Segnora de Guadaloupe,	863	96	232
Jesus Maria,	329	74	128
Total,	3503	661	1350

The whole number of deaths in the city and suburbs of Havanna, for that year, was 2366. Taking from this the number of deaths in the hospitals, 1016, as in the accounts which follow, leaves the number of deaths in the city, &c. generally, 1350, as stated above in the parish accounts.

An Account of the Number of Sick which were entered into the Hospitals of the City of Havanna during the Year 1801.

ROYAL HOSPITAL *of* ST. AMBROSIO, *for the Troops of the Army.*

Remaining on the sick list from the year 1800,	233
Admitted in the whole of 1801,	3612
Total,	3845

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Died in the whole of 1801,	132
Cured in do.	3506
Remaining on the sick list at the close of 1801,	207
Total,	3845

This proportionate number of sick to the whole number of troops stationed at the Havanna is very great, particularly for that year, as they had not been, for a considerable time, reinforced by recruits from the mother country, who are at first much reduced by the diseases of the climate: and the return must, therefore, include the *militia* who are embodied in time of war as regular troops, and occasionally perform garrison duty.

ROYAL HOSPITAL *of* ST. JOSEPH, *for the Seamen and Marines of the Navy.*

Remaining from 1800,	609	
Admitted in 1801,	2298	
	2907	Total.
Died in 1801,	240	
Cured in 1801,	2572	
Remaining,	95	
	2907	Total.

The proportionate number of sick to the whole number in the marine department, cannot, for evident reasons, be at all ascertained; the number of seamen in port, by the nature of the service, continually varying.

HOSPITAL *of* ST. FRANCISCO DE PAULA, *for Women, founded in the Year* 1668.

Remaining from 1800,	44	
Admitted in 1801,	317	
	361	Total.
Died in 1801,	121	
Cured in 1801,	200	
Remaining,	40	
	361	Total.

The great proportion of deaths in this hospital I cannot account for; and, indeed, I found it impossible to procure from any of the hospitals a circumstantial detail of the different or most prevalent diseases which occurred.

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HOSPITAL *of the* CONVENT *of* ST. JOHN *of* GOD. *(Franciscan Order.)*

Remaining from 1800,	945	
Admitted in 1801,	719	
	——1664	Total.
Died in 1801,	523	
Cured in 1801,	975	
Remaining,	166	
	——1664	Total.

The greater proportion of deaths in this hospital may be accounted for from the greater variety of diseases and circumstances under which the patients enter, arising from the indiscriminate and charitable admission of sick persons, whether natives or foreigners.

The whole charge for the American seamen which were latterly introduced into this hospital, was 50 cents *per diem* for each man, including medicines, attendance and subsistence; and they were pretty successfully treated.

Notwithstanding the severe duties of this order or hospital (not being numerous), their labours are not confined to the walls of their convent: they frequently visit sick and distressed objects abroad. The friars are early and regularly instructed in the practice of physic and surgery; and the establishment has existed so far back as 1602.

An Account of other Hospitals established in the Havanna, from which no Returns of Sick had been rendered.

ROYAL HOUSE *and* HOSPITAL *for exposed and destitute Children (Infants), founded in* 1706.

Admitted for the year 1801, 311

HOSPITAL *and* CHURCH *of* ST. LAZARO, *without the Walls, founded in* 1741.

This hospital is appropriated solely to cases of *leprosy*, of which there are many in Cuba. By the laws of the country, any person afflicted with that dreadful malady is forced to seclude himself from his family and society. Accommodations are accordingly provided; consisting of a number of houses and apartments, and a chapel, situated on the margin of the sea, and the whole enclosed by an high stone wall. The number of patients I could not accurately ascertain; but, from the best information I could procure, they amount, on an average, to about one hundred.

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HOUSE *and* HOSPITAL *of* BENEFICENCE, *for destitute Female Orphans, situated without the Walls.*

The number in this institution is, on an average, about seventy. The building is very large, commodious and healthy, situated upon the sea-board. The regulations are excellent, and daily superintended by a member (in monthly rotation) from the Royal Patriotic Society, of which the Governor of the island is president.

The girls are carefully educated in useful arts, well clothed and attended, and, finally, provided for by marriage, or reputable employments, at the discretion of the trustees. Some of the trustees give a public breakfast to the orphans, at their own houses, on the close of their monthly visitation. One, given by the Marquis de Montehermoso, I attended by invitation. I never witnessed a more cheerful display of comfort, ease and contentment.

This hospital, as well as most of the others, is supported by private contributions; and it is rendering but common justice to the inhabitants of the Havanna, to say, that they exhibit many proofs of public and private beneficence.

☞ We are happy to inform our readers, that the very valuable information contained in this communication of Mr. MORTON, is only a part of what he has collected during his residence at Havanna. We understand that he is in possession of many other notes and remarks respecting that city, and the island of Cuba generally, which may be expected to meet the public eye, on a future occasion, upon the pages of the Medical Repository.

NEW WORKS OF DR. PEARSON.

Dr. Miller has just received from Dr. George Pearson, of London, a copy of each of the following works by that learned physician, viz. "Principles of Physic, to be explained in a Course of Lectures:" also, "Arranged Catalogues of the Articles of Food, Drink, Seasoning and Medicine, for the Use of Lectures on Therapeutics and Materia Medica: and "An Examination of the Report of the Committee of the House of Commons on the Claims of Remuneration for the Vaccine Pock Inoculation."

The two former are not yet published, being principally intended for the use of those who attend the author's lectures. The last is designed to invalidate Dr. Jenner's *exclusive* claim to originality and remuneration in investigating and proposing the inoculation of the vaccine disease as a substitute for small-pox.

Dr. Pearson describes, in a letter accompanying the above-mentioned performances, the following simple and elegant experiment for showing the effect of Galvanism in decompounding water.—"Take a tube, about five inches long, and one

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fourth or half of an inch wide, open at both ends; fill it with water, having first stopt one end with a cork: then add to the water a few drops of muriatic acid. Pierce the cork at one end with a pointed wire of zinc, so as to pass about half an inch into the tube: then pierce in like manner the cork stopping the other end, but with a *silver* wire which is long enough, and bent so as to reach to the wire in the other cork. When the two wires are not in contact, no effect is produced in the water; but when they are made to touch each other, then immediately bubbles of gas begin to rise at each point of the wires within the water, the silver wire discharging oxygen, and the zinc hydrogen gas, and the zinc is seen to oxydate very rapidly."

Dr. Pearson has been engaged in some inquiries concerning the celebrated *Nepenthe* of the Greeks. He concludes that it was not our opium, but another vegetable substance. He has lately received a quantity of a preparation possessing such powers as to bid fair to be a great acquisition to the practice of physic, and, at the same time, to elucidate some otherwise unintelligible parts of the Greek writers as to the natural history of several products.

YELLOW FEVER.

In the course of the summer and autumn this disease appeared in Philadelphia, Baltimore, and Wilmington (Delaware). Some few cases were also observed at Portsmouth (New-Hampshire), and at some other places. But in all these situations, the instances of the disease, when compared with many former seasons, were so few, and the mortality so inconsiderable, that little alarm or suspension of business were necessarily produced. We hope to obtain more particulars from those several places for a future number.

MEDICAL GRADUATION IN THE UNIVERSITY OF PENNSYLVANIA.

The following gentlemen were admitted to the degree of Doctor of Medicine in the University of Pennsylvania, on the 27th day of May, 1802, *having respectively defended and published the dissertations annexed to their names.*

1. GEORGE LOGAN, of South-Carolina, on the Hepatic State of Fever.
2. WILLIAM WASHINGTON, of Virginia, on Diabetes.
3. CHARLES MEREDITH, of Pennsylvania, on Phthisis Pulmonalis.
4. JOHN DORSEY, of Philadelphia, on the Lithontriptic Virtues of the Gastric Juice.

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5. GEORGE THOMAS, of Virginia, on the Kalmia Latifolia and Angustifolia.
6. GRAFTON DUVAL, of Maryland, on the Melia Azedarach of Linnæus.
7. CHARLES MORRIS, of Virginia, on the Prunus Virginiana, or Wild Cherry-Tree.
8. PATRICK RODGERS, of Ireland, on the Liriodendron Tulipifera, or Poplar-Tree.
9. THOMAS D. PRICE, of Virginia, on the Magnolia Glauca, or White Laurel.
10. HEDGE THOMSON, of New-Jersey, on the Spigelia Marylandica, or Indian Pink.
11. THOMSON M'DONALD, of Virginia, on Cynanche Trachealis.
12. THOMAS ROWAN, of New-Jersey, on the Hydrophobic State of Fever.
13. WILLIAM NELSON, of Virginia, on the Peruvian Bark.
13. HENRY JACKSON, of Georgia, on the Efficacy of External Applications.
15. JOHN OSWALD, of South-Carolina, on the Phenomena of suspended Animal Life.
16. JOHN MARTIN, of Delaware, on the Vitality of the Blood.
17. JOHN C. GEDDY, of Virginia, on the Absorption of Medicines.
18. HUGH WHITEFORD, of Maryland, on the Catamenia.
19. JOHN MACE, of Maryland, on the Proximate Cause of Disease.
20. JOSEPH M'CRERY, of Delaware, on the Principle of Animation.
21. PETER FORSYN, of South-Carolina, on the Modus Operandi of Medicines.

MEDICAL GRADUATION IN COLUMBIA COLLEGE.

The following gentlemen were admitted to the degree of Doctor of Medicine in Columbia College, on the 9th day of November, 1802, *having defended and published the dissertations annexed to their names.*

1. NICHOLAS I. QUACKENBOS, on Dysentery, in order to illustrate the Mitchillian Doctrine of Pestilential Fluids.
2. RICHARD L. WALKER, on the Perspirable Fluids of the Human Body.

Dr. JAMES S. STRINGHAM is appointed Professor of Chemistry in Columbia College.

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MEDICAL REPOSITORY.

VOL. VI.—No. III.

ARTICLE I.

ACCOUNT *of the* WILD NORTH-AMERICAN SHEEP.

While the attention of the public is drawn to the domesticated sheep, and new and valuable varieties of this are brought hither from Europe, it becomes us not to be negligent of our native breed.

It is not universally known that there are species of sheep running wild in the woods of North-America. This, however, is the fact; and a dried specimen of one of them was lately brought to New-York by Mr. M'GILLIVRAY. *It was made known to Dr.* MITCHILL *by Mr.* SAVAGE, *and is now in his Museum. That enterprising artist has made two good paintings from it. This animal was killed in the north-western country, beyond the limits of the United States. It has very much the shape of the Elk, described and figured by Dr.* E. H. SMITH, *in the second volume of our work, p.* 168, *except that, instead of the deer's head and horns, it has the neck, head and horns of a ram.*

Though a species of Ovis, *it is clearly neither the* Ovis Ammon, Pudu, *nor* Strepsiceros, *of* GMELIN's *Linnæan System of Nature. Yet it has been noticed by travellers. Father* PICOLO, *the Spanish Missionary to California in* 1697, *mentions such animals as seen by him, and that he had eaten them, their flesh being tender and delicious.* (5 *Abridg. Philos. Trans. Lond. Part.* ii. *p.* 194.)

From this authority Mr. PENNANT *derived what he has mentioned about them in his Arctic Zoology, vol.* i. *p.* 13. *He quotes that two sorts had been seen in California; one as large as a yearling or two year old calf, with an head like a stag, and horns like a ram; the tail and hair speckled,*

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and shorter than a stag's: the other larger, and varying in colour, some being white, others black, and furnished with very good wool. The Missionary Fathers called them both sheep, from their resemblance to them.

The following extract from VENEGAS's *History of California (vol. i. p. 36, of the English translation), will give something of an idea of this creature. The figure therein contained is not very correct.*

"*In California are two species of wild creatures for hunting, which are not known in Old or New Spain. The first is that which the Californians, in the Monqui tongue, call a* Taye. *It is about the bigness of a calf a year and a half old, and greatly resembles it in figure, except in its head, which resembles a deer, and the horns very thick, like those of a ram; its hoof large, round and cloven, like that of an ox; its skin is spotted, like the deer, but the hair thinner; and it has a short tail. The flesh is very palatable, and, to most tastes, exquisite.*

"*The second species differs very little from a sheep, but a great deal larger and more bulky. These are of two colours, white and black; both well covered with excellent wool. The flesh of these is not less agreeable, and they wander in droves about the forests and mountains.*"

A more circumstantial account of this animal is contained in the following agreeable narrative.

MEMORANDUM *respecting the* MOUNTAIN RAM *of* NORTH-AMERICA. *By* DUNCAN M'GILLIVRAY. *Communicated to Dr.* MITCHILL *by Mr.* SAVAGE, *in a Letter, dated New-York, November* 24, 1802.

IN the fall of 1800 I was on an excursion, on horseback, through the plains that are situated between the Sascatchiewan and Mississourie Rivers, along the rocky mountains, accompanied by Mr. Thompson, a gentleman in the North-West Company's employ, five Canadians, and an Indian guide. Returning back to the north, we followed the course of the Bow-River into the heart of the mountains, with a view of examining them; and on the 30th November, at noon, we halted at the foot of the first ridge to graze our horses, and to ascertain our latitude. At a little distance ahead appeared a herd of small animals, which we took to be a species of the deer which are very numerous in that country. While Mr. Thompson was taking a meridian altitude, I went forward,

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with the Indian, to have a shot; and, on a nearer approach, was very much surprised to find, instead of deer, a herd of about twenty animals that were utterly unknown to me. Pleased with the discovery, I advanced very cautiously, keeping myself concealed from their view, to the distance of about sixty yards. Here I halted, and was examining them with all the curiosity that is natural for a man to feel on seeing any unusual appearance, when the Indian, impatient at my delay, and fearful of discovery, fired his gun, and killed a female on the spot. The herd, alarmed by the report, took to flight, and made for the rocks. Angry at the Indian's impatience, I pursued them with eagerness: he followed; and, in the course of the afternoon, we killed four more, two of which were young. I had the satisfaction to shoot a large male, whose motions appeared to guide the flight of the rest. His superior size and enormous horns made him the particular object of my pursuit; and I have preserved his skin, with a view of presenting it to the Royal Society. During the winter I had frequent opportunities of hunting this tribe, which has enabled me to make a few observations on it that may be of advantage to naturalists, towards ascertaining the genus or species of this animal.

The dimensions of the above male, taken on the spot where he was killed (namely, longitude 115 deg. 30 min. W. and latitude 50 deg. N.) are as follow; viz. length from the nose to the root of the tail, five feet; length of the tail, four inches; circumference round the body, four feet; the stand three and three quarters feet high; length of the horn, three and an half feet; and girth at the head, one and a quarter feet. The horn is of the circular kind, proceeding in a triangle from the head, like that of the ram. In short, this animal appears to be a compound of the deer and the sheep, having the body and hair of the first, with the head and horns of the last. The Crees, or Kristianeaux, distinguish this animal by the name of *My-attic*, or the ugly rein-deer. The slave nations, comprehending *Blood Indians*, *Piecans*, and *Blackfeet Indians*, call it *Ema-ki-ca-now*, which also means a species of the deer; but the Canadians, at first sight, named it the *Mountain Ram*.

It is only to be met with in the rocky mountains, and generally frequents the highest regions which produce any vegetation; though sometimes it descends to feed at the bottom of the valleys, from whence, on the least alarm, he retires to the most inaccessible precipices, where the hunter can sel-

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dom follow him. His appearance, though rather clumsy, is expressive of active strength, and the nimbleness of his motion is surprizing. He bounds from one rock to another with as much facility as the goat, and makes his way through places quite impracticable to any other animal in that country without wings. I know no animal which encourages pursuit so much as this. In his flight he frequently turns back, and stares at the hunter with a kind of stupid curiosity, which is often fatal to him. This ought, perhaps, to be ascribed to his ignorance of man; these mountains being so horribly desolate that they are but little frequented, except it be by some straggling war-parties of the natives.

The mountain ram, or sheep, though not very often seen, is to be met with, in considerable numbers, in some parts of the mountains. I have, on several occasions, seen herds of twenty or thirty, but generally not more than two or three of them together. Frequently I have been entertained with a view of one of them looking over the brink of a precipice several hundred yards above my head, scarcely appearing bigger than a crow, and bidding defiance to all approach. These frightful situations are quite natural to them. They run up declivities of hard snow or rough ice with facility. Pursuing them in these situations, I have been obliged to cut steps with my knife where they passed without difficulty. Sometimes you think their progress is stopped by a chasm or projecting rock; but if you attempt too near an approach, at one bound they are out of your reach.

The female does not differ materially from the male, except that her size is much less, and she has only a small black straight horn like the goat. The colour and texture of the hair is the same in both, and they are all distinguished by the white rump and dark tail. In other respects the female greatly resembles the sheep in her general figure, and particularly in the timid, good-natured cast of the countenance. In winter they frequent the southern declivity of the mountains, to enjoy the sunshine; the lower regions, and the valleys, at that season, being covered with a great depth of snow.

The flesh of the female, and of the young male, is a great dainty; for my own part, I think much more delicate than any other kind of venison: and the Indians, who live entirely on animal food, and must be epicures in the choice of flesh, agree that the flesh of the *My-attic* is the sweetest feast in the forest.

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ARTICLE II.

FACTS *and* EXPERIMENTS, *in answer to some* OBSERVATIONS *on* MERCURY, *made by* GEORGE LEE, *A. M. inserted in the Medical Repository, vol.* iv. *page* 356. *Addressed to the Editors by* JOSEPH GLOVER, *M. D. of Charleston (South-Carolina), in a Letter, dated February* 1, 1802.

EARNEST in the pursuit of Medical knowledge, and opposed to error in whatever shape it may appear, whether supported by the bold assertions of genius, whether originating in fancy or founded in superstition, I am induced to relate a few facts and experiments on Mercury, persuaded that investigation is the only road to truth, and that from it alone we are to expect the just decision of a question so interesting.

I shall endeavour to show, 1st. That it is not essential to the theory of oxygen, that an oxyd of mercury, when taken into the system, should be revived to produce its usual effects: 2dly. That certain effects are not to be attributed equally to all the constituent principles of a compound body; and, lastly, That it is to oxygen alone that the several preparations of mercury owe their activity.

1st. Many experiments have been related in favour of Mr. Lee's position, that the several preparations of mercury are not decomposed in the stomach. Facts, however, are not wanting to prove their decomposition on the surface of the body. It is well known that persons labouring under a mercurial action, have had their watches and buttons amalgamated by the revival of the quick-silver. Dr. Girtanner, after relating several facts of this nature, tells us, "The oxyd of mercury, in passing through the human body, parts with its oxygen, and it is to this oxygen alone, which remains combined with the system, that the effect produced by oxydated mercury is owing." Whether the Doctor means, in this case, that the mercurial oxyd is decomposed in the stomach by an acid, or whether he had rather be understood that it is taken up by the absorbents, and gradually decomposed by their action, as atmospherical air is by the lungs in respiration, I shall not attempt to decide; in either case, however, I differ from him, as it is by no means necessary that a mercurial oxyd should be decomposed to produce a mercurial action. Many substances, when taken into the stomach, have been proved to produce their ef-

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fects without decomposition; nay, have even been detected in the circulation in their active state. Dr. Hamilton detected globules of mercury in the milk of a salivated woman by slow evaporation.* Does not this at once show that it is not decomposed in the stomach, but enters into the circulation in its compound state?

I do believe that mercury acts as a stimulus *sui generis*, and that it produces its appropriate effects by its action as other stimuli do; and further, that it is oxygen alone which imparts to it its stimulating property. The former I infer from having observed the great similarity which exists between a mercurial action and that induced by some other stimuli; the latter, from its being the only one of the two constituent principles of mercurial oxyds possessing any activity when taken into the stomach, or applied externally to the human body.

Quick-silver is known and acknowledged by physicians to be inert. Dr. Girtanner has told us of his having known many people, who, for years, took a daily portion of it to the amount of one or two ounces, from an idea of guarding themselves from epidemic diseases, but who never perceived any effect whatever from this singular custom.† Does not this at once prove the correctness of the position we have taken?

2dly. The philosopher will not deem it improper that we should attribute certain effects to a particular constituent principle of some compound bodies, when he reflects that others with which it is combined are inert, or produce effects diametrically opposite. What now-a-days would be thought of the chemist who should teach that it is not oxygen which supports flame, but the compound atmospherical air; and that the effect is equally produced by its other constituent principles as by oxygen? Such is the condition to which our author has reduced himself. He tells us, "If certain effects are derived from the use of this acid (meaning the acid of septon), they are to be attributed to both its constituent principles, and not to one alone."

Lastly, Drs. Girtanner and Beddoes have attributed the salivating property of mercury to its combination with oxygen. On the contrary, it has been asserted, that other substances, for instance, camphor and seneka, also salivate. This we readily grant; but does it by any means prove that oxygen will not also salivate? Certainly not. Those arguments must, indeed,

* Barton's Lectures on Materia Medica.

† See Girtanner on the Principle of Irritability.

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be the production of no ordinary genius, which still carry plausibility with them, although supported by such negative proof.

Another, and the most plausible objection which has been advanced against the theory of Dr. Girtanner and Beddoes is, "that mercury, in two of its forms, is not oxyded; and, consequently, that its action in them, at least, does not depend on oxygen." The two forms are the blue pill and mercurial ointment, both of which preparations of mercury have been chosen, as fit subjects for a set of experiments, to prove their non-oxydation.

The experiments which were made on the blue pill are first related; the amount of which is, that there was some evaporation induced by the heat generated in the mass by trituration, the loss of weight being fifteen grains. We are next told of a comparative experiment, in which the trituration was continued for an equal length of time on the same quantity of flower and of conserve, and in which (the heat being less) the loss was thirteen grains. I shall forbear making many comments on these two experiments, as the candour of their author has induced him to acknowledge that "the evident impracticability of repeating these triturations exactly in the same way, will easily account for the difference in the results of the two last experiments." This is a confession that he believes the evaporation in each to have been the same; neither do I see how it could possibly have been otherwise, had the trituration been repeated under exactly the same circumstances. Even this difference of weight, however, is adduced to prove the non-oxydation of the metal; but, what an extent of error does it embrace! for although that principle of chemistry may be correct, which teaches that all bodies should become heavier by an addition, yet it has very little to do with the experiments in question. It is supposed, had the metal been oxyded, "the additional weight it would have received necessarily would have rendered the total loss in the first much less than in the last experiment." This too is an error so gross, it requires to be read only to be detected; for it cannot be presumed that the total loss of weight in the first experiment could have been less than in the last, when we recollect that the oxygen with which the metal is oxyded, is not, as the gentleman supposes, an additional substance, which should increase the weight of the mass. The metal received its oxygen from the decomposition of one of the ingredients of the mass; to wit, the syrup, and, consequently, the loss of weight from evaporation could not be expected to be less in the one experiment than in the other.

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From this explanation of the gentleman's experiments on the blue pill, it is clear they have proved nothing in his favour. The conclusions, therefore, which have been drawn from them, that the metal is not oxyded in the blue pill, and that its efficacy does not depend upon its combination with oxygen, are decidedly premature.

To do away every doubt on the subject, which even prejudice may suggest, I shall relate an experiment or two, which I presume will prove at once, that the mercury in the blue pill is so completely oxyded, that it is changed in its nature, and becomes an entire new substance both in appearance and properties. A dram of quick-silver, ten grains of rhubarb, and seventeen grains of molasses, were rubbed together until the quick-silver disappeared. The mass on weighing had lost ten grains, which I attributed in part to evaporation; but more to the impossibility of collecting it from the mortar. It is well known, that if quick-silver and water be added together, the particles of the one will have so little attraction for those of the other, that they will not unite; it is also known, that the other component parts of the blue pill, to wit, rhubarb and syrup, are readily miscible with that fluid; from whence it is evident, when the blue pill is rubbed in a mortar with water, if the quick-silver is only divided as the gentleman has asserted, it should be revived in consequence of the syrup and rhubarb, which had served to keep the particles of quick-silver asunder, being now mixed with the water; and again, from the particles of quick-silver having a less attraction for water than for each other.

On the blue pill being rubbed in a mortar with water, and washed well, it was found that the quick-silver was not revived as we should have expected from the gentleman's theory; on the contrary, when the mass had been deprived of the syrup and rhubarb by frequent washings, not only in cold but even in hot water, the quick-silver was found to be unrevived, and fell to the bottom of the vessel in the state of a black oxyd. Here then the nature of the quick-silver is proved to have been completely changed.

The mercurial ointment has also been pronounced not to be an oxyd of mercury. Here I may make a similar objection to the first experiment, which is related to prove this position, that I have just done to an experiment or two on the blue pill; to wit, the determining by weight the oxydation, or non-oxydation, of the ointment by two comparative experiments. Equal quantities of lard were triturated with and without mercury,

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for the same length of time, and because the one containing mercury did not lose less of its weight than the other, it is concluded, with more ingenuity than reason, that the mercury is not oxyded. To this I reply, as in the former instance, that the oxygen with which the mercury is oxyded, is not an additional substance, and, consequently, cannot increase its weight; but that it is afforded by the decomposition of the lard, one of the constituent parts of which is oxygen. This is proved by one of the gentleman's own experiments, from which it appears, that mercurial ointment, triturated in a certain quantity of atmospherical air, produced no diminution of that fluid.

The lard which was used not being saturated with oxygen by rancidity, is also adduced as a proof of the non-oxydation of the ointment. I would ask whether lard, the most free from rancidity, does not afford a sufficient quantity of oxygen to oxydate quick-silver; and further, if the gentleman has not found that rancid lard, or, in other words, lard saturated with oxygen, together with ready made mercurial ointment, &c. all tend more speedily to kill quick-silver (as it is commonly expressed), in the forming of mercurial ointment, than substances containing a less quantity? Again, Fourcroy tells us, that if the oxygenated pomatum should not prove of any avail in medicine, it might be made use of to subdue quick-silver the sooner, and to prepare the ointment of it in a fifth of the time that is usually required.* Does it not appear, from these facts, that oxygen has a very considerable effect in the speedy preparation of mercurial ointment; and, moreover, that it acts by oxydating the quick-silver, and rendering it thereby the more easily miscible with lard?

As "a strong argument against the oxydation of mercury," an observation of Mr. Cruickshank, "that the globules of quick-silver, in the best prepared mercurial ointment, may be distinctly seen by the microscope," is related with great gravity. Would it not have been equally to the purpose, had our author informed us, that "if the ointment is not well made, the globules may be discerned still more readily by the naked eye?" The microscope can only bring to our view those globules of mercury which are too minute to be distinguished by the naked eye; it can by no means prove that a portion of the mercury is not oxydated. It is the mere subterfuge of enthusiasm. If mercurial ointment is melted and poured carefully

* See Med. and Phys. Journal, vol. iii. p. 58.

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off into another vessel, the greater part of the metal will be found at the bottom in the state of an oxyd.

We are again seriously told that the "corrosive sublimate of mercury is a more complete salt than calomel, on which state alone its superior powers depend." Here we would pause awhile, to know correctly the meaning which is intended. It is surely not the design of the gentleman, at once to dazzle the eye of reason by the new light in which he has placed this subject, nor yet to puzzle our judgments by the ingenuity of his logic. Calomel and corrosive sublimate are both composed of mercury united with the muriatic acid, the former differing from the latter only in containing a less quantity of oxygen. But it is said, that the one is a more complete salt than the other. I would ask, what constitutes it a more complete salt? Is it not its being united with a more concentrated acid, the acidifying principle of which is acknowledged to be oxygen, and which being the only additional substance, must be acknowledged also as the cause of its superior activity?

However paradoxical it may appear, that we should admit the small quantity of oxygen contained in a few grains of corrosive sublimate, as the cause of a febris mercurialis, and yet believe in the oxygenation of the blood by respiration, it is no less a fact. Vital air diluted, and in the state of atmospherical air, is a stimulus to which the lungs are accustomed; its effect, therefore, will not be expected to be such as, when applied in a highly concentrated state, in the form of corrosive sublimate, to the stomach, an organ by no means accustomed to its action. In the one instance it is a natural and accustomed stimulus; in the other, an artificial and preternatural one. That there is a great difference in the violence of action induced by the same stimulus when applied to different parts of our system, is a fact too true to be denied; but why our systems are so constructed, must remain with him alone whose wisdom far exceedeth the narrow limits of human demonstration.

Oxygen, when combined with particular substances in a highly concentrated state, is one of the most powerful stimulants in nature. To it, the common oxyd of arsenic, or white arsenic as it is called, owes its great activity. This was clearly proved in a piece of great merit, read some time since before the Medical Society of South-Carolina, by Joseph Johnson, M. D. from which it appears, that by depriving the common white arsenic of a portion of its oxygen by deflagration, it lost so much of its activity that he could give a grain of it in the form of a pill several times a-day, not only with safety, but even

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with advantage, in the cure of intermittents, when other medicines had proved ineffectual. I do not recollect ever to have known of more than an eighth of a grain of arsenic being given at a dose, in an undeflagrated state. It will not, therefore, be denied, that by depriving arsenic of a portion of its oxygen, we deprive it also of so much of its activity; from which we presume, that oxygen is the constituent principle which imparts to it its stimulating property. The method made use of by Dr. Johnson was the burning of two ounces of spirits of wine over a dram of the oxyd of arsenic, which deprived it of so much of its activity as to enable him to give the dose mentioned. By increasing the quantity of spirits of wine, the activity of the arsenic, he has since proved, is proportionably diminished.

ARTICLE III.

A SHORT HISTORY *of the* YELLOW FEVER *which prevailed at Norfolk in the Months of August, September and October*, 1801; *with some Account of the Diseases that preceded and followed its Appearance. Communicated by Drs.* SELDEN *and* WHITEHEAD, *in a Letter to Dr.* MILLER, *dated Norfolk, July* 15, 1802.

THE great influence of the weather and climate over the health of man, especially when combined, in places of crowded population, with the agency of local causes, is universally allowed. At no time has the truth of this observation been more conspicuously verified than during the summer and autumn of the year 1801, in most parts of Virginia, and in a particular manner at Norfolk.

The spring was extremely cold, and the progress of vegetation consequently very slow. The first week in May had elapsed before the trees were completely covered with foliage. The 25th of June had arrived before we began to feel any inconvenience from the heat of the weather, being sheltered from that degree of it, usual at this season, by frequent falls of rain, and a cloudy sky, which had hitherto prevailed. The thermometer had varied from the 70th to the 87th of Fahrenheit, which it had never exceeded, in the hottest part of the day, previous to the last six days in the month of June. But, from this time to the beginning of July, the

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weather was serene and intensely hot; yet no sensible effect was observed to result from it, either on the health or prevailing diseases of Norfolk, as it was immediately followed by occasional falls of rain, and that cloudy sky which had obtained so generally in the months of May and June. This state of the weather continued, with little variation, till the 23d of August.

Early in June, numbers began to be affected with intestinal fever, under the different forms of diarrhœa, or of dysentery. In most instances these complaints ran a tedious course, exhibiting symptoms of severity or mildness corresponding exactly with the variations of the weather. Nor was it in Norfolk only that febrile diseases, at this time, seemed to fall chiefly on the intestines; throughout the State similar complaints prevailed; but the attacks were more frequent, as well as more violent, in this town, Richmond and Petersburgh. The number of those affected with this form of disease increased gradually as the summer advanced; and though, in some cases, great distress was experienced, and dangerous symptoms sometimes made their appearance, yet instances of death were rare; and the greatest part were neither confined in their apartments, nor compelled to relinquish their ordinary pursuits. The town was, in other respects, during the whole summer, uncommonly healthy; and as those affected with bowel-complaints were generally of the old inhabitants, who had been proof against the attack of the much-dreaded epidemic of the United States, this circumstance was regarded by some as affording reasonable grounds of belief that the atmosphere of Norfolk was free from those causes necessary to the production of yellow fever, and that, for this year, we should escape the ravages of this direful calamity. But these flattering hopes were speedily cut off.

During the whole of the month of August, and particularly after the 23d, some sporadic cases of yellow fever were reported to have occurred; but these were almost entirely confined to the shipping and Marine Hospital, and obtained neither the name of an epidemic, nor caused any alarm or uneasiness among the inhabitants of the town. On the 1st of September, however, the weather became extremely hot, calm and serene. Not a cloud was to be seen, for eleven days, to afford shelter from the scorching rays of the sun, which, for that time, were poured upon us with increasing violence. By a thermometer, fixed in a passage with free circulation of air, eleven feet above the level of the street, and twelve from a

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door fronting the south, in a part of the town well ventilated, and not crowded with houses, the mercury frequently rose to 94, and was seldom below 90, in the hottest part of the day, from the 1st to the 11th of September. At 10 o'clock in the night, during the same space of time, the mercury was found several times standing at 90 degrees of Fahrenheit.*

This extreme change of weather, in the beginning of September, was, as might have been expected, followed by one not less remarkable in the form of the diseases of Norfolk. The intestinal fever entirely disappeared, and, by the 7th or 9th of the month, the cases of yellow fever had become so numerous as to deserve the name of an epidemic, and rouse public apprehension; while those persons (as far as our observation extended) who had laboured under the former affection were found generally not subject to an attack of the latter disease. On the 10th and 11th the number of the sick increased greatly; but, on the afternoon of the last of these days, the mercury fell to the 71st of Fahrenheit, and the wind, which had blown from the south-west since the beginning of the month, veered about to north-east, with a cloudy sky, and some rain. But this change did not stop or check the progress of the epidemic: on the contrary, so much more frequent did the attacks of this form of fever become, from the 11th till the 15th of the month, that the mind was strongly impressed with the belief, that the rapid increase of disease had, in some measure, arisen from the sudden change of the weather which then took place, although such as is generally supposed favourable to health. We believe this will generally happen in situations favourable to the generation of yellow fever, when the change of temperature from heat to cold is sudden, but not sufficiently great to check, or extinguish wholly, the seeds of the disease.† Whether the cold, on this occasion, acted, according to the opinion of Dr. Rush, by accumulating excitability, and thereby rendering the system more sensible to the stimulus of the disease; or whether, by checking

* No very accurate idea of the temperature of the atmosphere in which the inhabitants of Norfolk lived, and transacted business, can readily be collected from the thermometer, during the first three or four days after this change of weather commenced. The earth, the houses, and the air contained in them, had been so cooled by the rains and cloudy weather immediately preceding, that several days elapsed before these instruments were completely under the influence of the heat which pervaded the atmosphere of the place. To this cause is to be ascribed the very considerable variations of the mercury observed at this period in Norfolk.

† Vide Rush on the Yellow Fever of 1793, p. 30 et seq.

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powerfully sensible and insensible perspiration, and detaining within the body secretions which nature, under the influence of an unusually powerful stimulus of heat, finds necessary to eliminate, this sudden fall of the temperature overthrew the equilibrium and healthy actions of the system, in corrupting, in some measure, the whole mass of circulating fluids, and thereby disturbing and altering the various secretions formed from them.

We shall not here enter into a detail of those causes, unfriendly to health, which may be considered as arising from the situation and state of our town. Such an account would differ but little from that given in the 4th volume of the Medical Repository, p. 329, and to it we refer in this particular. But other, besides atmospherical and the local causes of Norfolk, combined to augment the spreading of the yellow fever. On account of the high price given for American produce in England, all the ships fit for the purpose that could be procured, had been constantly dispatched, during the summer, for that market; so that, in the months of July and August, the harbour was almost entirely clear of shipping, and very few sailors remained in the place. Previous to the commencement of the hot weather in September, several vessels, at different times, had arrived from Europe, with a great number of passengers on board. Those who remained in town had hitherto suffered little from sickness; but, after being exposed to the extreme heat in the beginning of this month, many of them were taken sick; and, being generally, from their indigent circumstances, badly lodged and attended, numbers of them fell victims to the disease. The wind, which, on the 11th, changed from south-west to north-east, brought in a vast number of vessels; so that, by the 15th, our harbour was crowded with ships, chiefly from Europe. The fever now spread rapidly, and increased in malignity; and many of the sailors and passengers of those newly arrived ships were among the number of the sick. It was, no doubt, unfriendly to the health of the seamen to be employed in discharging so many cargoes, near one place, at the same time. To unlock so many reservoirs of air, which had been so long pent up, and rendered impure by the circumstances of a long voyage, was not only prejudicial to the health of those who, in the presence of a prevailing epidemic, were compelled, in some measure, to live in it; but, when wafted into the adjacent parts of the town, by the wind blowing from that quarter, might contribute to augment the ma-

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lignity of the disease which already existed there. About the 20th of September the disease was at its height, but it continued to the end of the month, with very little abatement of its violence; the cool weather which came on the 27th producing little alteration, either as to the frequency of the attacks, or the course and severity of the symptoms. It gradually declined during the month of October; and, by the 1st of November, scarce a vestige of it was to be found.

But, in proportion as the yellow fever subsided, the intestinal complaints that preceded its first attack began to reappear. Towards the end of October, many recoveries from the fever were rendered tedious by a dysenteric affection supervening; and some who had resisted the violence of the former, sunk under the wasting influence of the latter disease. The dysentery was, however, confined to no particular class of the community, like the fever; nor was it marked with that character of malignity which often attends it when it appears as an epidemic.

The number of deaths, during the present epidemic, was fully as great, for some weeks, as in that of 1800; although, during the continuance of the fever, fewer died in this than in the former year. The deaths occasioned by the fever we are now describing were evidently greatly augmented by the accidental arrival of vast crowds of emigrants from Great Britain and Ireland, during the violence of the fever; who, being mostly of the laborious poor, and with large families, without the means of comfortable subsistence, were placed in the most unfavourable circumstances for recovery; and their whole families thus fell a sacrifice to the ravages of the prevailing distemper.

The plan of treatment pursued this year was, in many respects, similar to that adopted in 1800, of which we have formerly given some account. The lancet, however, was more sparingly employed, as symptoms indicating its use seemed less to require it. Calomel, in all cases, was liberally exhibited, both with a view to produce, in the commencement, a full and speedy evacuation, and afterwards, also, in such forms as have been found to bring on most readily a salivation; which, in every instance, with us, as has been often noticed by others, was followed by the certain recovery of our patient: Where topical affections occurred we had recourse to local remedies. Cupping and vesication, when early employed, afforded, in such cases, very frequently, great relief. Neither theory nor experience warranted the

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early exhibition of bark; we always deferred it till some change in the febrile symptoms began to appear, and the irritability of the stomach had abated. But, under every form of treatment, numbers fell victims to the disease. In this juncture, being desirous of making every effort that promised any advantage, we had recourse to a remedy we had last year tried in a few cases with some benefit, and now found attended, as far as it was carried, with unequivocal success. This was the liberal affusion of cold water; not on the plan prescribed by some of the writers of the West-Indies, but in a mode similar to that recommended by Dr. Currie, of Liverpool.

The first trials were made on young robust British seamen; and the good effects of the remedy equalled our most sanguine expectation. The pulse often after the affusion of the cold water was thereby reduced thirty strokes in a minute; the burning heat of the skin was greatly lessened, and the thirst, head-ach, and other uneasy symptoms, were much alleviated. The patient generally found himself so much relieved and refreshed after the cold bath, that he submitted, not only without reluctance, but with pleasure, to a repetition of it. If called in on the first or second day of the attack, we first directed a strong dose of calomel and jalap, in order to procure a full evacuation from the bowels; after which the patient was ordered to be carried on deck, with only a great coat thrown loosely around him, and three or four buckets of salt water from the river to be poured on his head and naked body. This operation was repeated, when the febrile symptoms threatened to return with their former violence. Three times a day was usually sufficient. We rarely found it necessary to continue the use of the cold water longer than the fourth day; during which time the bowels were generally kept open by the occasional exhibition of a bolus of calomel.

From the great benefit experienced in the two or three first trials, we proceeded to recommend it with confidence. Of all those patients to whom we had an opportunity of exhibiting this remedy, on or before the second day of the attack, we had the good fortune not to lose one; but after this period, when the fever had begun to subside, without symptoms of amendment, the affusion of cold water seemed to serve only to hasten the fatal catastrophe. In no instance was it used without the exhibition of calomel at the same time, and we might have been inclined to ascribe to the last mentioned medicine the sole merit of the cure that was accomplished, had it not failed, with us, sometimes under the fairest trials.

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No disagreeable effect was produced by combining the use of calomel with the affusion of cold water; nor, in a single instance, did the mercury occasion salivation, although the discharge from the bowels was scarcely as great as when it was used alone in the cure of the disease. But, in almost every instance which terminated favourably, when the cure was trusted to calomel alone, without the cold bath, some degree of salivation came on, and the appearance of this discharge was beheld with pleasure, being regarded as an infallible mark of safety.

It is with the fullest conviction of the superiority of this plan of treatment to any we have yet tried, that we venture to record its effects. The subjects of our experiments were those in whom we found the disease to attack with the greatest violence in the commencement, and to act with the most fatal force on their constitutions. We shall attempt no theory of the manner in which the salutary effects of cold bathing in yellow fever are produced, nor venture to recommend it as a certain remedy; but we think that, in the hands of a skilful and judicious physician, it may often prove a powerful auxiliary, in enabling him to combat the fatal effects of that direful calamity we have been describing.

ARTICLE IV.

A curious DISEASE *in a* WORKING OX: *In a Letter from Mr.* WILLIAM STIGNEY, *to Dr.* MITCHILL, *dated Nov.* 10, 1802.

AS I am well assured that you are ever fond of every kind of information that may conduce to the propagation of science and of the useful arts in this country, it is with pleasure that I submit to you an account of a singular substance, which has been discovered in the muscles of an Ox, which might, perhaps, be of some advantage to the honest cultivators of the soil, if it should be examined by some of them. They may be rendered thereby, perhaps, more inquisitive concerning the diseases of their flocks, and endeavour to gain a competent knowledge in the business of raising and fattening cattle.

During my residence at a farm-house, in the interior of Orange county, New-York, last January (1802), the man of the house, on butchering an ox, had the curiosity to call me to witness the situation of a thing which he called a phenomenon

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in nature. On parting the shoulder from the neck he discovered a large tumour, of an oval figure, buried in the portion of the neck which lies below the fore-part of the left shoulder. On cutting out the tumour, we made particular search for a passage, which we supposed there might be leading from the first passages, or from some external part into the tumour, but could not discover the least passage whatever. Upon opening the tumour we found it to contain nearly a pint of a species of dung of a soft consistence, similar to what is sometimes found in rotten logs. After extracting the dung, we proceeded to examine the bag, which was of a strong muscular consistence: its internal surface was lined with a tough skin, thinly covered with whitish hair about an inch long. Upon my making some inquiry concerning the ox, the gentleman informed me, that he had been accustomed to the yoke for three or four years, and that he had been an uncommonly strong, active ox, for a considerable time, but at length he became so dull and stupid, that he was no longer fit for service; that he had been feeding the ox about a year, in order to render him fit for market, but he found it almost an impossibility to fatten him; the reason of which he supposed must have been the tumour in his neck, though he had never known the ox to receive any wound or have any disorder whatever. I must assure you, Sir, that I was at a loss to account for such a quantity of filth being collected and remaining so long in the flesh of one of the most healthy kind of animals in the world. My thoughts, on the subject, were various and unsettled. Perhaps there might have been a rupture of the alimentary canal, and a part of the aliment have found a passage into the loose flabby flesh which composes the parts of the neck below the shoulders, and thus have formed the tumour; after which the rupture of the canal, and the passage, might have healed up, and left the filthy matter confined within the sack: or, as the ox had been accustomed to the yoke, the bow, by long pressure upon the sides of the neck, might have wounded the muscles so as to cause an open abscess, where filthy matter might have collected, and the surface of the sore have closed so as to remain undiscovered. However, as my ideas on the subject are only conjectural, and by no means conclusive, I beg leave to submit the subject to those persons who are able to discover the secret operations of nature, in the animal and vegetable world, and to teach her invariable laws to the meanest capacity; and more particularly to those gentlemen who have appropriated a part of their attention to the business of raising stock, who are ac-

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customed to observe the diseases which are common among cattle, and to apply some remedy for their removal. I take the liberty to refer the subject for their investigation. Could not the tumour have been discovered by feeling carefully along the neck of the ox, and have been taken out by dividing the integuments, without endangering the life of the animal, and he have been restored to his natural activity, to the profit and benefit of his owner? Would it not be beneficial to the community, if the physicians and men of observation, in the different parts of the continent, should transmit, in written documents, to some one of the established Medical, Philosophical or Agricultural Societies, a true history of every new and uncommon disease, which may happen within the bounds of their knowledge among the human species, or among those animals which have become a necessary support to the ease and happiness of the human race? If they should give an accurate account of every discovery made in the various branches of agriculture, such as gardening, orcharding and vineyarding; also of raising and fatting domesticated animals, with an account of the remote and proximate causes of the diseases which are common to man and beast, in their respective cities and townships, it would add eminently to our mass of useful knowledge. Should the man who traverses the unfrequented desert, in pursuing the chase, give a description of all such springs of water, plants, shrubs, and roots, as are not common in the inhabited parts of this extensive country, this would also be a valuable addition. When the like information is collected from every part of this new and extensive country, and when the man of common genius is stimulated, by the genuine love of science and liberty, to seek and perpetuate his own safety, with the happiness and liberties of his fellow-citizens, by extending every kind of information which may come within the sphere of his knowledge, will there not appear an extensive field yet to be explored by the Naturalist, the Botanist, the Chymist, and the man of leisure?

I have the satisfaction to be,
With sentiments of esteem,
Yours sincerely, &c.

WILLIAM STIGNEY.

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ARTICLE V.

REMARKABLE CASE *of* PHTHISIS PULMONALIS, *wherein a profuse spontaneous Hæmorrhage seemed to be useful: In a Letter from Dr.* TRACY, *of Norwich (Connecticut) to Dr.* MITCHILL, *dated July* 16, 1802.

IN the month of April, 1801, I was requested to visit Miss A. B. a young female aged seventeen years, residing in the vicinity of this town, who had been for some time previous in a debilitated state of health, which, rather from its continuation than its apparent formidableness, had created some anxiety in the minds of her friends, who now had become solicitous for my advice. On visiting the patient, I found her of a delicate organization, with a clear skin and florid complexion, and narrow chested, with elevated scapula; light blue eyes, and pupils more than ordinarily dilated, with that pearly transparency of the cornea, which is usually observed in phthisical habits. On examining the complaints of the patient, I found she had been for some weeks previous affected at turns with slight fever, a hecking cough, and pain in her right side, often extending to the shoulder point, and erratically affecting the thoracic region; her respiration was quick and much accelerated by exercise. On examining her pulse, I found them frequent, with the shortness of stroke which so peculiarly characterizes a hectical diathesis. On a critical examination of all the symptoms attending the case, I became fully convinced that it was an incipient *phthisis pulmonalis*; probably arising from a tuberculous state of lungs, which would terminate fatally. Under this impression I suggested to her friends my opinion of the nature of her case and its probable issue. At their request, though but with little confidence that any system of treatment I could adopt would obviate its fatal tendency, I undertook the charge of the patient. The practice I adopted was repeated though small bleedings, a mild mercurial deobstruent course, combined with a nutritious though bland diet, with gentle exercise, and mild opiates at night. This method was pursued for two months with regularity, but without any apparent benefit; the patient evidently lost ground, and at the expiration of this period, discovered the most unequivocal evidences of a fully established *phthisis*; her cough had become urgent and very distressing at night, except suspended by opiates. She now had daily rigors, followed by

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exacerbations of fever, and colliquative sweats at night. Her evening paroxysms of fever were attended with that circumscribed, though highly *oxygenated* tinge of the cheek, which is so peculiarly characteristic of a full established *hectic*. Her respiration was short, with increased quickness and tension of pulse, and great prostration of strength. With symptoms so portentous, but small hopes of restoration could be indulged; but wishing to gratify my patient and her friends, by making every additional medical effort that might be safely adopted to remedy the complaint, I omitted the former practice, and adopted the use of the *digitalis*, in the form of a saturated tincture: this she used some weeks; but no apparent good effect arising, and it exciting great nausea, with a vertiginous affection of her head, I was induced to omit its further use. In the room of which I substituted the *kali sulphuratum*, combined with *carbone*, agreeable to the direction of Dr. Garnet: this, on being used some time, failing to produce any visible good effect, and being very offensive to her stomach, was omitted. The routine of *hectic symptoms* still continued, and clearly evinced the second stage of the disease to be fully established. She by this time had become much emaciated, and so weak as to require assistance in walking. I now with her friends abandoned all hopes of her recovery, and recommended a mere palliative practice, consisting of opiates, with cordials and mild stomachics. At this period, when hope, the usual though insidious attendant of the complaint, had deserted her; an *hæmorrhage* from the nose (epistaxis) took place, which continued, with little intermission, for sixty hours, notwithstanding every usual medical effort was made to check it, and which finally seemed alone to yield to the great exhaustion of the vital fluid. The patient, at a very moderate computation, must have lost at least six pounds of blood during the continuance of the hæmorrhage, exclusive of one pound which was drawn from the foot during its continuance. So great a loss of blood necessarily produced an extreme increase of debility, with constant *deliquium animi* on attempting to arise in bed, for several days, and seemed to portend a speedy dissolution. Under these new and threatening symptoms, I was convinced that the tonic and stimulant medicaments had become necessary in the case, and I adopted the liberal use of bark, with the elixir vitriol, and wine, combined with a nutritious animal diet. Here I ought to premise, that at the termination of the hæmorrhagy, the tense pulse which had marked the complaint during its former progress, had remarkably subsided, they having be-

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come softer, with less frequent vibrations; the respiration was also fuller, and performed with much more ease than in the antecedent state, with a material abatement of cough. This mode of practice was steadily persisted in, with the most promising prospects; the rigors and exacerbations of fever subsided, the nocturnal sweats diminished, and the cough wholly disappeared; and although the patient for several months continued very languid, still a gradual amendment was visible, with a steady abatement of the hectic symptoms. At this time the subject appears in good health, and is as capable of undergoing fatigue, in the domestic concerns of a family, as is usual for young females to practise.

Aware that many cases of *chlorosis* in young females, which have terminated happily, have been mistakenly pronounced, by their attending physician, to be true cases of *phthisis*, I have been more minute in describing the leading symptoms which attended this case, and trust it will appear to every well informed mind, that the *diagnosis* of an exquisitely formed *hectic* decisively marked the complaint; and I feel it incumbent to add, that the essential symptoms of *chlorosis* at no period existed during her sickness.

How justifiable an imitation of this violent, though salutary effort of nature might be in similar cases, which so usually baffle our art, is a question that merits mature consideration; but on this subject might it not be admissible to adopt the sentiments of an ancient father in physic, when he says, *melius est anceps remedium quam nullum?*

ARTICLE VI.

An ANALYTICAL DESCRIPTION *of certain* STONY CONCRETIONS *(Phosphates of Lime), coughed up from the Lungs, by* JOSEPH SHILDIGGER, *a Patient in the New-York Hospital, with Practical Remarks on their Formation. By M.* LE BARON DE CARENDEFFEZ. *Read before the Physical Society of New-York, October* 6, 1802.

THIS man was by trade a stone-cutter, and was admitted into the hospital with phthisical symptoms. He had great difficulty in breathing, violent cough, expectoration of purulent matter, sometimes mingled with blood, considerable emaciation and night sweats. He also frequently brought up small stones, which have amounted, by estimation,

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to more than two hundred. In proportion as these have been voided, his symptoms have been relieved. A suspicion had arisen that these stony concretions were formed from the dust, inhaled while he was at work in shaping quarry-stones, by his mallet and chisel, for the purposes of architecture. A parcel of these hard substances which he had spit up, having been given by the patient to the attending physician, and obligingly put into my hands for examination by Dr. Mitchill, I take this opportunity of communicating to the society the result of my inquiries.

These morbid or preternatural calculi were of irregular shape, very hard and of a greyish or pale slate colour.

When subjected to the operation of acids, both vegetable and mineral, for some time they became white, and seemed to be softer as they lost their grey colour, which appeared to be derived from a glutinous slime.

Treated by watery solutions of alkalies, both in their caustic and carbonated states, this glutinous substance was not decomposed, but separated, dissolved, and converted into a whitish compound resembling soap.

Some of the concretions were then mixed with an equal weight of carbonate of soda, grown dry by spontaneous efflorescence, and exposed to the heat of a reverberatory furnace, to determine whether they were of a silicious nature. But nothing of a vitrifiable nature was observed. Failing thus to obtain any kind of glass, I concluded they contained no silicious ingredient. The crucible then being taken from the fire, cooled and inspected, I was surprised to find the concretions in a heap, and suspended, as it were, in my crucible, without having undergone any change of their original figure, and without manifesting the smallest signs of vitrification. At the same time the whole inside of the bottom of the vessel was turned to glass, by means of the silicious matter which, as is well known, is a constituent ingredient of the Hessian crucibles which I employed.

On taking them from the crucible I found they had become brittle, and could easily be rubbed to pieces between the fingers: the gluten had been consumed, and they had become as white as in the former experiments.

On weighing them again, they were found to have lost scarcely three grains of their original weight; a loss which I ascribe to the animal gluten which connects, and, as it were, cements the particles together.

Some of the calcined matter being then reduced in a mor-

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ter to a very fine powder, I first diluted it with a little water, and afterward poured on it about two-fifths of its weight of good sulphuric acid. Having been mixed well, they were exposed, for three hours, to a moderate sand-head. On examining the mass, I found it thick, viscous, and adhesive. I diluted it with water, and it reddened the tincture of litmus, and possessed a sour but agreeable taste. This was easily distinguishable for being an acidulous phosphate of lime; 1. By its dissolubility in water; 2. By its precipitating with lime-water, a regenerated insoluble calcareous phosphate, which was not decomposable by alkalies; 3. By its forming, with ammoniac, soda, pot-ash and magnesia, as many particular phosphates. These phosphates precipitated a true phosphate of lime from the mixture, by depriving it of the surplusage of acidity; and from this surplusage only these new phosphates were formed. To this excess of phosphoric acid, the mass owed its solubility and fluidity, for as soon as it lost this superfluous portion, it became an insoluble precipitate.

The oxalic acid acted upon this acidulous phosphate in a much more powerful manner. It decomposed it entirely by attracting its calcareous basis. Therewith it formed immediately an insoluble oxalate of lime. This fell to the bottom, while the liberated phosphoric acid swam in the liquid above it. I washed this precipitated oxalate of lime in water until it became tasteless, and then, on decomposing it by the carbonates of potash and soda, obtained carbonates of lime.

The sulphate of lime, formed by a decomposition of a part of these concretions, was purified and separated from the acidulous phosphate of lime by repeated washings. Being unable to decompose this earthy salt by carbonates of potash, soda, or ammoniac, I succeeded in forming an hydro-sulphure of lime by means of powdered charcoal in a sufficient heat. From this I obtained the sulphur by means of vinegar.

The result of all these experiments is, *that these pulmonary stones or concretions are true* PHOSPHATES OF LIME.

Their formation is owing probably to the great quantity of this calcareous salt carried into the system, with both vegetable and animal food. In order to keep it dissolved in the fluids, the constitution ought to be supplied with a surplusage of phosphoric acid. When there is a deficiency of this phosphoric menstruum, these concretions are formed in different parts of the body. Hence, when there is no excess of phosphoric acid in the blood and secretions, we so often find concretions similar to these in the kidneys, in the bladder, in the bronchia, in the lungs, and in other places.

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There is every reason to believe, both from the probability of the thing, and from chemical experiments, that such concretions as these would not be formed, if there existed the requisite superabundance of phosphoric acid. For if this was present in sufficient quantity, it would soften, dissolve and hold in solution the neutral earthy salt in all cases, after the same manner that the great quantity of it in healthy urine is kept dissolved and suspended.

The oxalic and sulphuric acids seem to have a powerful agency in totally loosening the compages of bones, and of disposing them to be dissolved in water; while the other acids, of whatever kind, though they may appear to dissolve them, do no more in fact than separate the particles, which, instead of undergoing solution, are precipitated in the form of a white and granulated power.

All these facts which I have seen and derived from my own experience, in submitting these concretions to the action of different acids, and all the others which I have gathered from experiments made on calculi of the kidneys and bladder, convince me that most reliance is to be placed on THE OXALIC and PHOSPHORIC ACIDS for destroying these terrible concretions. While the *nitric* and *muriatic* acids recommended by Messrs. Fourcroy and Vauquelin, do not act so powerfully upon these calculi, are more disagreeable to the taste, and are more stimulant upon the living parts, without having a proportional action upon the stones. On the other hand, considering that the *oxalic* and *phosphoric* acids may be exhibited in greater quantity and higher concentration than the others, I think them highly deserving the attention of physicians: I therefore recommend them to their notice and trial, as promising to do much in the cause of humanity, both in the form of drinks and injections.

ARTICLE VII.

DESCRIPTION *of a remarkable Species of* INTESTINAL VERMES: *Communicated to Dr.* MILLER, *by* JAMES S. STRINGHAM, *M. D. Professor of Chemistry in Columbia College, and President of the New-York Physical Society.*

THE relation of occurrences, which from our reading and observation, we find seldom to have presented themselves to the eye even of the most experienced medical practitioners, is a duty incumbent as it is important. It is by this means that

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the limits of our inquiries are extended, and that we are prepared to encounter events, the existence of which we might never have suspected, till, by a fatal termination of the disease, dissection points out to us the presence of circumstances, of which, had we been previously aware, a different plan of cure would have been adopted, and the life of the patient probably preserved. This is a mode of acquiring experience truly humiliating; but how is it to be avoided, unless every physician, while he derives benefit from the observations of others, endeavours, at the same time, to contribute his mite towards the promotion of general knowledge, by a careful and faithful delineation of such particular occurrences as he conceives to be new and interesting? Under this impression I feel myself impelled to offer to your consideration the history of a case, the singular termination of which excited no small degree of surprise in all who witnessed it.

About nine months ago I was called upon to visit a lady in this city, who had been for some time in ill health. I found her somewhat emaciated. She had little or no appetite; complained of almost constant pain in the breast, near the xiphoid cartilage of the sternum; she had no cough; respiration was perfectly free and easy. I took from her a small quantity of blood, ordered a cooling purgative, and put her upon the use of the digitalis, with a light diet. This plan was persevered in for some time, till she took forty drops of the tincture, three times a day; beyond this it affected her head and stomach. Finding however that this did not produce the desired effect, I added a blister, which I kept discharging for several weeks. By this her complaints were so much relieved that I considered any further attendance as unnecessary. My patient went out of town, and I heard no more of her for several months, when she again sent for me. She informed me that she had continued free from her pain for a considerable time after the blister had healed, but that it had again returned, and as she thought with increased violence. The complexion was pallid; her pulse weak and irregular; her appearance much more emaciated than when I saw her last. I again put her upon the same treatment, and again the blister relieved her pain: the suspension however proved but temporary; her former symptoms returned; in addition to which she also complained of great pain and soreness in the abdomen. I treated her upon the plan generally adopted where such indications exist, but without the least success; the pain in the abdomen particularly became extremely urgent, and she frequently told me, that when riding the smallest irregula-

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rity of motion in the carriage produced sensations almost insupportable. Her stomach had become so irritable, that every species of food was rejected as soon as swallowed; a constant tenesmus supervened, although she voided no fæces unless assisted by cathartics or injections.

Finding every effort to relieve my patient ineffectual, that on the contrary her disorder appeared to be increasing, and her strength rapidly declining, I began to apprehend that death alone could alleviate her sufferings: I therefore entirely confined myself to palliatives, the principal of which was laudanum. She continued in this miserable state of existence several weeks, during which time the only moments of ease that she experienced were those passed in insensibility. On one of my morning visits to her, while in this situation, she told me that she was convinced in her own mind, that her complaints were kept up by some animal within her; that she could distinctly perceive its motion, particularly if she fasted for any length of time, and that she was compelled, by the uneasy sensations it produced in her stomach, to endeavour to take food although she had no appetite for it, after which she felt greatly relieved. Supposing that her mind, enfeebled by the long-continued sufferings of her body, had become impressed with some of those incredible fictions, which report snakes and different kinds of reptiles to have become inhabitants of the human system, I at first ridiculed the idea; but finding that she was obstinately pertinacious of her opinion, I was under the necessity of promising to give some medicine which would dislodge the animal, should any such exist. For this I gave her a bitter infusion to be taken in the morning early, and at night a drastic purgative; which plan she was to continue every second day till she had taken three doses of each. I called to see her on the morning after she had taken the second dose; I was surprised to find her appearance uncommonly cheerful, and at her first salutation to me, "Doctor, I shall yet get well." On inquiring into the cause of this sudden change, her husband informed me that she had voided a considerable number of animals, of what kind he could not pretend to say, as he had never before seen any thing like them. The pot was shown me, in which I discovered a considerable number of substances which I did not hesitate to pronounce animalcular. The nurse informed me that the medicine had operated very severely on my patient, and that she still continued to experience its effects. I requested her to convey another pot into the room, telling her that I should remain some time below stairs, and that if the medicine should again

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operate while I continued in the house, it was my wish to see what was evacuated. I had not waited long before my curiosity was gratified; scarcely any fæces were to be seen; the excrements consisting almost entirely of these substances, some of which I had put into a bottle filled with spirits, in order to examine them more particularly at my leisure. They were about three fourths of an inch long, and to the inferior part of the body of each were attached a considerable number of legs. On first view I thought that they were separate parts of several large worms, and that what appeared like legs, were nothing more than the different laminæ or filaments of the skin, separated by maceration. But, on a closer examination, I rejected the opinion, because the back of these animals did not appear to be covered by skin, but by a firm cartilaginous substance; there was likewise an uniformity of appearance and structure, which is not observed in filaments of the skin thus separated, viz. they were vesicular, each resembling a distinct sack, distended with a fluid, colourless and transparent. But as it is impossible to convey any distinct idea of these animals merely by verbal description, I transmit to you a drawing of them, taken by Dr. Alexander Anderson, of this city, which very exactly represents their real appearance: the original I still retain in my possession, for the examination of any gentleman whose curiosity may prompt him to observe them in a manner still more satisfactory. For my own part I have very little doubt that they belong to the order of vermes molusca, and to that genus termed actinia. I consider those vesicles as tentacula or legs, by which they adhere to different substances while feeding on their prey.

That this particular species of worms should be found residents of the human body, is, so far as my reading extends, entirely novel. Considering it a duty to do all in my power to aid the laudable efforts of yourself and colleague for the diffusion of medical information, I submit the above case to your inspection, with liberty to make such use of it as you may think proper.

Yours, &c.
JAMES S. STRINGHAM.

P. S. Since writing the above I have met with a case, described in the sixth volume of the transactions of the Royal Irish Academy, by Dr. Samuel Crumpe, which bears considerable analogy to that which I have just related to you, so much so, that I suspect the worms to be of the same genus, but can

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by no means agree with him in his speculations regarding their origin. These animals are found frequently floating in different kinds of waters, and, from experiments, many of them have been proved to resemble the polypus, in its powers of being multiplied by cuttings. May it not then easily be conceived, that some fragments of them should be swallowed with the water which these two patients drank, and that by adhering to the coats of the stomach and bowels, they should have become so numerous as to produce the effects already described. It may be proper to add, that since the voiding of these worms, the health of my patient has been perfectly restored, and that she has had no return of her complaints.

ARTICLE VIII.

REMARKS *on Mr.* LEE'S EXPERIMENTS *and* OBSERVATIONS *upon* QUICKSILVER: *By Dr.* S. BROWN, *of Boston: Addressed to Dr.* MITCHILL, *June* 25, 1801.

THE publication alluded to will be found in the Medical Repository, vol. iv. p. 357. It bears intrinsic marks of powers of mind above mediocrity, of real talents for investigation, and of ability for ready writing. The reader will decide whether prudence, candour, a cool and deliberate understanding, and a heart beating sensibly for truth, are more the characteristics of the author of this piece than of the gentleman he combats; and whether the production itself, notwithstanding the *experiments* it contains, "gleams only an ephemeral ray of reason, or reflects the durable and animating lights of truth."

Before I further proceed, let it be understood that I adhere to opinion only as it appears to be founded in truth and fair reasoning. Of either of the gentlemen implicated in the present subject of controversy I have no personal knowledge, and am acquainted with them only from their writings. From these I conclude them to be men of sense, and therefore entitled to my esteem and respect. Nay, were I fully persuaded that the position combated were in fact erroneous, and had any thing more satisfactory been advanced upon the subject than in the doctrine of the late professor of Gottingen, and the famous physician of Clifton, I should be silent. Candidly, I think the subject has not gained any recent accession of

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light: it is as much surrounded with hypothesis as ever. I proceed to state the doctrine in question, ascribed by Mr. Lee to the German physiologist and his English expositor, and to consider the reasons which have been opposed to it.

"These gentlemen believe that mercury, when introduced into the body, owes its activity to oxygen, with which they suppose it is always combined." This doctrine, we are told, was once as confidently adopted as it is now strenuously opposed. Who would not be captivated by, and admire the theory of the *modus operandi* of a class of medicines (called sialogogues) which reduced it to so plain and so intelligible a point, as that *oxygen was the universal principle of salivation?* I forsook this belief, however, nearly as soon as I had attached myself to it: for, after some study, and not without satisfaction, its absurdity struck me in the most forcible manner. Why, it was natural to inquire, attribute the effects derived from the administration of mercury to oxygen, and not to the metal itself? or why use the latter if the former is alone the agent by which every thing is effected? 1. Because, if applied to the system in the naked state of oxygen, it would be *immediately* absorbed, and employed in the various combinations and decompositions which are constantly taking place in the stomach and lungs, in the regular discharge of the animal functions; and thus a medical or specific effect upon the system would be prevented. 2. Because, when introduced in the state of mercurial oxyd, it probably is conveyed through the chylopoetic viscera, and quite to the extremities of the arterial system, before it parts with its base; where, by stimulating the lymphatics and glands, a salivation is produced. If the writers whom Mr. Lee controverts have asserted that oxygen is the *universal principle of salivation*, the assertion, very possibly, is carried too far. Yet, that it is not mercury alone which salivates, is conceded, upon the testimony of Dr. Barton, in the instances of salivation by copper, camphor, and seneka. Perhaps there is no material element which holds so close an alliance with the vital principle as oxygen, and this, above every other consideration, induces us to believe that it is the grand efficient in all the most important preparations of materia medica, either by combination with them as radicals in the system, or by decomposition from them. But the principal reasons which led to a suspicion of the validity of the aforementioned doctrine are,

1. "Many substances salivate which do not contain a particle of oxygen; of course, a salivation may be induced with-

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out the presence of oxygen. Dr. Barton, in his lectures on the materia medica, mentions the case of a child, who, in consequence of swallowing a cent, was salivated. The coin, when discharged, was diminished in size a fifth part. The copper, in this case, when swallowed, contained no oxygen; and to say that it became oxydated in the stomach, is an evasion which, on account of its absurdity, merits but little attention." But if there were no oxydation and consequent erosion of the metal from the acidifying principle, by what means was it diminished a fifth part? Was it *melted off* by the heat of the stomach? Under this article a doubt is implied, whether the stomach ever contains an acid of sufficient strength for metallic oxydation. I only know, what many others know from experience, that it frequently contains an acid sufficiently concentrated to produce very great heat and distress, at least equal to a *febris mercurialis*. And in *cardialgia* cretaceous preparations are prescribed with the intention of neutralizing the acid which is the cause of the complaint. As to salivation from camphor and seneka, the fact is doubted, with deference, however, to the respectable authority upon which it rests: at any rate, this is not the uniform tendency of these medicines in their more general operation; or, if this effect ever is produced, it must be owing to some peculiar state of the system previous to their administration. Mercury has no qualities in common with copper, camphor or seneka, yet they individually produce salivation! This mystery requires solution. We dare not confide it to the ingenuity of the gentlemen whose opinions I espouse, but refer it to their opponents.

2. "It has been said that sulphur relieves a sore mouth by combining with the oxygen which was the cause of the disease. But, in answer to this, were I to inquire, is the sulphuric acid formed in this case? I should receive but an unsatisfactory answer." Well, here it is: Such a result would possibly obtain, were the quantity of oxygen sufficient, and were it compatible with the laws of the animal economy to admit the process. We do not sufficiently consider that the circumstances necessary to be observed in accurately conducting *chemical* experiments, cannot apply to the various processes of the animal system. "Again—Dr. Barton says, in his lectures, that he has seen, in a number of cases, the effects of mercury upon the mouth abated in a very surprising manner by the use of opium. I do not know that opium has an affinity to oxygen!" The concluding sentence seems to

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be dictated in the triumphant spirit of the laurelled hero. This fact, upon which so much stress is laid, is at least balanced by the following from Hufeland's Journal, and is thus related in the Medical and Physical Journal of London, vol. iii. p. 586: *An old woman fell into a considerable salivation after every dose of opium she took, in whatever form it was given.* The comments of the editors upon this fact are strictly in accord with the contested notion respecting the action and efficacy of mercury. Here, then, are two effects from the operation of the same medicine, that are diametrically opposite. The state of the animal powers, therefore, has a joint concern with the qualities of any medicine in determining its peculiar effects. In the treatise by M'Lean and Yates, it is stated as a medical axiom, that every article in the materia medica capable of carrying the excitement to a certain point, will salivate! Opium is mentioned as frequently producing this effect. *I do not know that opium has any affinity with quicksilver!*

3. "It is well ascertained that the heat of the human body is not sufficient to deoxygenate mercury in the forms in which it is generally used. It is true that trituration alone will revive precipitate *per se*. This preparation contains but a small quantity of oxygen, and all higher degrees of oxydation require a temperature many degrees above 98 to disengage the oxyding principle from mercury." It may require a temperature above 98 to disengage the oxyding principle from its combination with mercury by an artificial chemical process; but there is no proof that the oxyd cannot be decomposed by a much lower temperature when submitted to the action of the digestive and assimilating organs. In this third article I can see nothing to invalidate the theory of Girtanner: it rather confirms it; for the revival of the precipitate *per se* is accounted for upon the idea of its containing only a small quantity of oxygen. But if there is a deficiency of the acidifying principle in this preparation, it is inert in the same proportion.

4. "Mercury may be rendered invisible by triturating it with rhubarb and honey, in the space of two minutes. Is it to be presumed that this metal can be oxyded in so short a time?" Yes; and if the presumption is not well founded from the remarks that have already been offered, it will, we think, be rendered probable in such as are to follow. Upon what principle do many chemists recommend triturating first with a small quantity of *rancid oil*, and afterwards with the lard, in order to expedite the process of preparing the mercurial unguent?

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5. "A few grains of corrosive sublimate will salivate, which do not contain, *perhaps*, a thimble full of oxygen. Can gentlemen tell you that this small quantity of oxygen will produce a *febris mercurialis*, who believe themselves in the oxygenation of the blood by respiration? If this paradox can be reconciled to common sense, it is to be effected only by the ingenuity of a Girtanner or a Beddoes." Then I shall blush to be known as an advocate of this doctrine. Let us see to whom the reproach of supporting paradoxes belongs, and who is on the side of common sense and reason. A certain supply of oxygen is always necessary to the support of animal life, there being a constant expenditure of this ingredient in the various combinations, secretions and excretions of the animal system. When this supply exceeds a certain point, an increased action of the vessels takes place, and the secretions become more abundant. If the over-supply becomes great, the excitement is proportionably extensive; the body feels an unusual heat, and the circulation is much accelerated: at length profuse perspiration breaks forth, accompanied with increased salivary secretion, and thus the healthy medium of action is restored, and the system relieved. There is, then, no mystery in even a small quantity of oxygen producing a salivation, if the body were previously saturated with oxygen to the healthy point; more especially if the oxygen should not be evolved from its metallic base till it arrives to that part of the system where its stimulation is *immediately* upon the evanescent arteries and salivary glands. Thus much upon the *thimble full of oxygen*.

If objections of the like nature with the above were multiplied *ad libitum*, and could be extended *ad infinitum*, the validity of the doctrine would not, in the least, be impaired thereby; its fabric would still remain compact, and its foundations unshaken. The *experiments*, however ingeniously contrived and conducted, conclude no more than that, by trituration, the mercury becomes oxydated, not by oxygen from the superincumbent atmosphere, but by a change in the order of affinities in the different substances of the triturated mass. The loss of weight might be occasioned, in part, by evaporation from the generation of heat, but more by adherence to the surfaces of the vessels in which it was triturated. But we are answered that it is improbable the mercury becomes oxydated from the lard with which it is triturated, because the lard has a stronger affinity for oxygen than mercury. This is said to be proved by boiling lard upon an oxyd, when the

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metal will be revived. I should like to be informed whether the lard gains any weight, or is made rancid by this process. Much error frequently arises from not discriminating between heat and mechanical agency, as employed in the preparation of medicines. Mechanical power has no chemical relation to the substances it acts upon, and, therefore, the change which substances undergo is wholly according to the affinities subsisting between them, independent of the operating power. But heat is entirely a chemical agent, and, therefore, the changes it produces upon a collection of different substances is more according to their individual affinities with heat, the operative power, than from any reciprocal influence upon each other. In the latter case something is actually imparted to the substances acted upon; in the former, nothing. This may suffice to explain why lard, by *trituration*, will oxydate mercury, and, by *boiling*, deoxygenate, allowing the fact to be true as stated above.

The author of the dissertation which is the subject of these remarks, after a little diversion with saccharum saturni and white lead, goes on to explain why, in his opinion, sublimate of mercury is more powerful than calomel—*because the one is more a complete salt than the other. Calcined* quicksilver, however, is not a salt, yet it is not less efficacious than *muriated* quicksilver. In like manner, because nitrous acid is not so perfect an acid as the nitric, it is said to be less powerful. But reduce, by dilution, the nitric acid to the strength of the nitrous, and will there be any difference in their medicinal effects? Is there not the same proportion of azote in equal quantities of the two acids? What, then, makes one more efficacious than the other, but the difference in the quantity of oxygen in combination? The question is not whether the effect of the acids of nitre are exactly the same as that of oxygen when it is combined with azote; the primary question was, whether mercurial preparations were not efficacious in exact proportion to the quantity of oxygen they contain. This has not yet been disproved.

One objection more remains to be noticed. It is denied that either of the above articles, viz. mercurial preparations, or the acids of nitre, undergo decomposition in consequence of any vital action upon them. This fact, it is confessed, is as incapable of demonstration as it is difficult to prove the comminution and decomposition of the food and drink we use for nourishment. To doubt the fact in either case "is an evasion which, on account of its absurdity, merits but little

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attention." In my opinion, a more difficult thing to prove is, that either food or medicine ever passes from the primæ viæ, and through the round of circulation, without being both *decomposed* and *recomposed.*

By this time it can be determined whether the advocates of the doctrine we have endeavoured to defend are justly chargeable with being so much infatuated by the perverting poison of enthusiasm, as that nothing has been able to cool their ardour, or to put a stop to their wild career. "Oxygen has been the burden of their song; and, in the pursuit of this question, common sense has been offended, whilst prudence has been unable to mark out a single limit to their range. Candour has long since retired from the scene of action: for, while the heart beat sensibly for the truth on one side of the question, self-love and misguided fancy proclaimed victory on the other."

It was my intention to have recapitulated the leading facts and principal arguments favouring the contested doctrine; but this must be deferred for the present.

ARTICLE IX.

ADDITIONAL REMARKS *on Mr.* CRUIKSHANK'S EXPERIMENTS *on* FINERY CINDER *and* CHARCOAL: *Communicated to the Editors by Dr.* JOSEPH PRIESTLEY, *in a Letter dated Northumberland, November* 15, 1802.

THOUGH I have sent you several remarks on Mr. Cruikshank's observation on my argument for the doctrine of phlogiston, from the experiment with finery cinder and charcoal; yet as he has replied, and the French chemists, the great patrons of the new theory, acquiesce in and applaud his answer, I have been led to give more attention to the subject, and this has suggested further proofs, as they appear to me, of the fallacy of his hypothesis. That the chemists in this part of the world may have an early opportunity of forming a judgment on the state of the controversy, which is certainly of considerable importance, I send you the following distinct statement of my objections to the *principle* which Mr. Cruikshank has assumed, which is entirely different from that of Mr. Berthollet, or that of Dr. Woodhouse, and in my opinion more exceptionable than either of them.

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1. Mr. Cruikshank's hypothesis requires that in the process of heating finery cinder and charcoal, the oxygen in the finery cinder should quit that substance, and unite with carbone in the charcoal, in order to form *fixed air*. Since, however, this fixed air is to be decomposed, the oxygen which it has got from the finery cinder must be separated from it, and enter into the same calx again. But while the heat continues the same, I deem these contrary effects to be impossible. If the degree of heat that is applied expel oxygen from the calx, it will certainly prevent its return. Consequently, if fixed air could be formed, it could not be decomposed, in these circumstances.

2. If the oxygen should quit the fixed air, nothing would remain of it but carbone, as before their union; and this is a solid substance, incapable, without the aid of oxygen, of assuming the form of *air*. Whence then comes the inflammable air in this process, which so nearly resembles that from charcoal and water, that they must have the same origin? And in this case Mr. Lavoisier himself decides that whatever is *inflammable* in it must come from *water*.

3. Admitting all that Mr. Cruikshank alleges, concerning the difference in the specific gravity, and other circumstances, between the air from finery cinder and charcoal, and that from water and charcoal, it is not so great as the difference between this latter and the light inflammable air from the metals with acids or water. Different as they may be in other respects, they are all *inflammable*, from their affinity to oxygen, and their property of uniting with it in a certain degree of heat; in consequence of which they are alike the reverse of *oxydes*, and must be classed among *combustible substances*, equally with sulphur and phosphorus.

4. If the oxygen, after quitting the finery cinder, entered into it again, it would make it finery cinder as at the first, or at least in some degree. But the calx is completely revived in this process; the iron so revived being as soluble in acids as any iron whatever.

5. If the iron should be completely revived in the former part of this process, by the oxygen wholly leaving it, I maintain that it could not by any degree of heat decompose fixed air; since this cannot be effected by the heat of a burning lens of sixteen inches diameter, in the space of several hours, in only a very few ounce measures of the air. Mr. Cruikshank's process with *bladders and a gun barrel* I have frequently used, but I never had any satisfactory result. The scale he found

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on the iron, I have no doubt, came from moisture in the air or the bladders.

6. Mr. Cruikshank seems to think that charcoal cannot contain any oxygen; but Mr. Tennant's fine experiment decisively proves that it does. For where are we to look for the oxygen (which we all acknowledge to be a component part of the fixed air) which is separated from the marble, but in the charcoal that is produced? And in that it makes part of a solid substance, and does not take the form of air.

7. Since oxygen and all combustible substances unite and explode, in a certain degree of heat, the oxygen expelled from the finery cinder uniting with carbone from the charcoal when red hot must enable it to burn; and therefore, in these circumstances, there ought to be an explosion, or at least a gradual combustion of them in the course of the process, as there is when oxygen is put to the same substance and heated with it afterwards.

It is now near twenty years since this new theory was advanced, and from that time to the present I have not ceased to express my opinion of its fallacy, and to give my reasons for that opinion; but I have not till very lately been able to draw much attention to the subject. Now, however, that I have succeeded in this, I flatter myself that the controversy will come to a speedy termination.

ARTICLE X.

An ACCOUNT *of a* PLANT *called the* MAGATHY-BAY BEAN, *or* ACCOMAC-PEA, *cultivated for fertilizing Lands: In a Letter to Dr.* MITCHILL, *from the Hon.* JOHN DENNIS, *Representative in Congress from Maryland, dated Washington City, December* 10, 1802.

IN conformity with your request, you will find herein a brief description of the Northampton Bean, sometimes called the Accomac-Pea, alias the Magathy-Bay Bean, with an imperfect sketch of some of its principal properties and uses. Having no pretentions to a knowledge of botany, this communication will be that of a husbandman, and the information requested will be given in that plain, inartificial manner, of which I am alone capable, and which will be the most intel-

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ligible to the mass of agriculturists, and perhaps, therefore, the more useful.

The above-mentioned bean or pea is a plant of annual growth, varying from eighteen inches to three and a half feet in height, according to the fertility of the soil. It grows in almost every kind of soil, however poor by nature, or impoverished by an exhausting cultivation; though it succeeds best in a light, loose land, and does worst in hard binding clay. It has a small tap root, and a few inconsiderable lateral roots, with a wide-spreading top, covered closely with a foliage, and bearing a pod, with pease or beans therein contained, strongly resembling the leaf, pod and pea of the locust-tree. It has therefore been denominated, by some, a locust-tree in miniature. This plant has the singular property of expanding its foliage in the day, and of contracting it in the night, thereby admitting the passage of the dews to the earth, and of excluding therefrom the rays of the sun. To this cause has been very much attributed its supposed efficacy in the amelioration of the soil.

The modes of propagating and perpetuating it are various, but those generally in use, and most approved, are the two following; viz. to sow with oats, or other small grain, in the spring, from a pint to a quart of the pea or bean to the acre; or you may sow it on the ground newly ploughed by itself. If the land be of a light, loose quality, you may sow the above quantity on wheat, or on the land unploughed; but if the soil be stiff and binding, it is necessary to plough it. As it is sometimes injured by the autumnal frosts, and never sprouts till late in April or the first of May, it may be desirable, in your northern latitudes, to sow it as early as possible; and where it is sown on wheat, or by itself, on account of the length of time for which it lies on the earth before it germinates, it may be scattered over the ground in February or March. The other method most approved, and that which is the most economical with regard to seed, is to plant two or three of the peas or beans in the hill with Indian corn, common peas or beans, and suffer it to grow and ripen with the same, which it will do without any injury thereto; and, from the multiplicity of seed it contains, and the elastic tendency which it possesses in the bursting of its pods, it will spontaneously seed the earth with as much or more regularity than it can be effected by any other mode. The shortness of your summers, and the liability of the pea to be injured by the frost, form the only objection to the latter mode in the State of New-

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York, and therefore, perhaps, the other is to be preferred. When the earth is once replenished with the seed, it will perpetuate itself, provided that where the land be stiff the ground be broken once every year, and, where light, once in two years. I have usually planted the land in Indian corn, and seeded it in oats or other small grain, and cultivated it alternately in the one or other every year; and this is the most effectual and expeditious mode of introducing and of perpetuating it. The year the land is in corn, all the pease that sprout in the spring will be destroyed by cultivation; but there still remains in the earth a sufficient quantity to seed it, which will come up with wheat, oats, or other small grain, the succeeding spring, in great profusion; will grow and flourish with it; and will have attained a height, by the time of harvest (which, in Maryland, is in July), that is sometimes, though not generally, in the way of the scythe. As soon as the grain is removed, it progresses with great rapidity, and attains its growth some time in August—overshadows the land, suffocating and excluding all other weeds and grass. It now puts forth a yellow blossom, which (particularly in our large plantations), causes the field to exhibit a most beautiful appearance for a few weeks, and ripens in the month of October, affording to the bees, in its bloom, delicious sustenance, and to the sportsman, in its maturity, delightful amusement, in the large number of quails which it attracts, and for which it furnishes a nutritious food, whilst it shelters them from the hawk. After the pea is ripe, we frequently open the enclosure to cattle and sheep, and other animals, and the cattle and hogs are fond of and fatten on it, but carefully exclude cattle and sheep from it in its green state, since they speedily destroy it.

The principal use, however, to which it is applied, and for which it is the most prized, is its application as a manure, to which it contributes as well by its properties before-mentioned, of expansion and contraction, to which may be added that of attraction, as by the great quantity of litter which it leaves on the earth. The spring succeeding its growth we find it a little in the way of the plough, and the labourers frequently complain of it on that account; but, after two or three ploughings, it dissolves, and mingles with the earth, and, by the middle of summer, is scarcely perceptible. It opens a close binding land, and fertilizes and adds to the soil wherever it grows; but if it will only leave the land as it found it, under the severe but profitable system of exhausting cultivation, of Indian corn one year and small grain the next year succeed-

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ing, for twenty years together, we apprehend it is a great point gained with us, in our worn-out lands, where other sources of manure are yet unattainable in sufficient quantities. In the county of Northampton, in Virginia, where this plant was first discovered to be useful, they have cultivated their lands every year, for twenty years last past, in Indian corn or oats, and find the land, without the aid of any thing but the pea, considerably improved. The ardent and impatient, who expect from it all the effects of a dung-heap, will, however, be disappointed; and the husbandman who is contented to grow rich and flourish by a slow and progressive system, will alone duly appreciate its merits, and continue its cultivation.

I have communicated all that I deem important on the subject, but will, with pleasure, answer any queries which you may think proper to suggest; and will refer you to the Hon. Mr. Stratton, who resides in the county in which this plant was first discovered, and where it is now in universal use, for a fuller account of its valuable properties.

ARTICLE XI.

Observations *on the* Functions *of the* Liver, *and on the* Importance *of that* Organ *as possessing great* Associate Influence, *and as a frequent* Seat *of* Morbid Affections; *being an Abstract of a Paper read before the Physical Society of New-York, October 7,* 1802. *By Dr.* Malachi Foot.

A CONSIDERATION of the *associate* diseases of the liver would be naturally preceded by that of the *primary* diseases of that organ, and also a description of those morbid conditions of the alimentary canal, arising from the varying states of the bilious secretion; but a detail so lengthy as would be necessary fully to accomplish this, is, with propriety, here limited to a few observations.

The liver, whether we form our estimate from its functions in health, or the evil consequences of its diseased state, is one of the most important organs of the human body. Its office, together with those of the *gall-bladder* and *ductus communis choledochus*, is to supply the intestines with bile for the purposes of digestion, and preventing the inconveniences resulting from the natural decomposition of food within the alimentary canal.

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Digestion has, till lately, been considered as one of the most mysterious functions of the animal body. It is the great leading process of that assimilation which converts dead animal and vegetable matter into nutriment and organized life.

Digestion differs so materially from that natural decomposition of bodies, during the process of fermentation, that the slightest degree of the latter, within the alimentary canal, is productive of inconvenience. The disengagement of noxious gases, and especially of that mephitic poison, a product of the putrefactive process, abounding particularly in the lean of animal meats, is among the evils of imperfect assimilation.

The great efficacy which the bile exerts in preventing these evils is not always justly appreciated. The properties of pure bile are saponaceous, alkaline, and oleaginous; whence the liver has lately, with much propriety, been termed "the great manufactory of soda for the purposes of the system."

Whether *dyspepsia* is ever idiopathic, simply as respects the stomach, is very problematical. The old opinion, that trituration constitutes a very considerable part of the business of digestion, has become more inadmissible since the explosion of mechanical doctrines as explanatory of living actions.* The gastric juice being a secreted fluid, like all other secretions, varies with the state of its secretory organ; yet the marks of diversity, as to its quantity or morbid qualities, are by no means so conspicuous and distinct as those of the *bilious* secretion.†

There exists between the stomach and liver a most intimate and important association. The latter, in its healthy state, is ever ready to perform its offices at the instance of the former. In ordinary states of the digestive function, when the articles taken in are of a proper nature, and in due quantity, the presence of a very large store of bile is not necessary; but such is its importance, that an absence of this friendly fluid, even for a short time, merely as respects the stomach, is attended with the greatest inconveniences. Its primary and ordinary office is to meet the aliment in its passage from the pylorus through the duodenum, and at that instant when it might otherwise assume the most noxious

* See the Experiments of Spallanzani on this subject.

† Dispensing with the consideration of the theory of digestion, every physician must have noticed, that the most prominent symptoms attending the dyspeptic may be resolved into the effects which naturally result from a deficiency in the bilious secretion. Does habitual dyspepsia seldom occur without evident marks of a *torpid liver*?

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forms, intimately to combine with it, disarm it of its deadly weapons, and render it a peaceable passenger in its mazy course. The quantity of bile excreted into the duodenum, within certain bounds, is proportionate to its need. Such is the animal economy, that those qualities which require an extraordinary quantity, provoke an unusual secretion. This is particularly exemplified by the presence in the stomach of a strong acid, and especially that noxious form of it resulting from the natural decomposition of aliment. When united to an acid, bile is changed to a greenish colour, termed "porraceous," and, in this vitiated and remarkable form, is exposed to our view. Such are the healthful qualities of this fluid, in its pure state, that the term "redundancy of bile," in physic, is as improper as that of "excessive virtue," in ethics.

Do the several modifications of diseases of the alimentary canal arise from diversity of temperaments (as they are described by Dr. Darwin), and the influence of epidemic causes? May not the liver often be said to be the primary seat of these diseases, or the medium through which epidemic causes operate? And will not a balance between the noxious agents and the antiseptic virtues of pure bile ever insure health? Inferences, drawn from some modern principles, promise much towards a solution of these inquiries.

Sympathy may be defined to be that synchronous or successive condition of two or more parts of living bodies, arising from the operation of a local cause. Mechanic reasoning can with no propriety be applied to the explanation of the important doctrines of association. It is not satisfactorily explained by the trite notions of vascular or nervous anastomoses; nor is it to be assigned, *en masse*, to contiguity of origin in the sensorium commune. To become an adept in this science, requires a more complete acquaintance with that principle which constitutes the difference between living and dead matter, the origin of our early motions, and the manner and extent of the operation of external agents. Though I cannot second the declaration of the great author of the Brunonian system in execrating physiology, yet I possess a strong impression that the study of it contributes but partially to an acquaintance with the interesting doctrines of morbid association. As a specimen of its inadequacy, I might challenge the ingenuity of the best informed physiologist, even with the aid of a most lively fancy, to explain satisfactorily the phenomenon of *singultus nephriticus* (hiccup from calculus in the kidney), or the cause of *tensio penis* in *hydrophobia*.

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The important office of the liver, in furnishing the bile, is only equalled by its possessing over the system a strong and most extensive associate influence. This organ obviously derives its extensively controuling powers through the medium of the stomach, which having commenced its functions in our earliest embryo-state, and being the great seat of our pleasurable sensations, may almost be termed the seat of life.

It is a happy provision in the animal economy, that these organs, exposed, as they are, from the nature of their offices, to the exciting causes of disease, while they possess a high degree of *irritability*, are almost destitute of *sensibility*. The liver, as a second link of a train of associations, and possessing rather more sensibility than its principal (the stomach), assumes her morbid states, and transfers them to a third part, possessed of still more than herself: thus gastritis is a disease of less frequent occurrence than hepatitis, and a phlegmon of an inferior extremity, or an affection of the parts about the right shoulder, is of more frequent occurrence than either.

Among the associate diseases of the liver we may class some of the following.

1. *Erysipelas.* This is a sensitive affection of the external surface, frequently sympathetic of a morbid irritation of the membranes about the liver, and belongs to Dr. Darwin's class of associate diseases. As there is an intimate consent between the internal viscera and external surface generally, this disease may arise from an affection of some other viscus. It is commonly preceded by a fever of two or three days continuance, terminating in this metastasis (of action, not of fluid) to the surface. As the cause does not reside in the place of its appearance, it is liable to recede on exposing the part to cold. Of the same origin is the pimpled face of females of habits of great associability, and the *gutta rosea* of intemperate persons.

2. *Gout* and *Rheumatism.* Are not these diseases often of hepatic origin?

3. *Colica Saturnina.* The *modus operandi* by which *lead* produces its deleterious effects is not well understood. Its most obvious property is that of a great stimulus to the absorbent system. In the cases in which it proves injurious marks of a torpid liver are conspicuous. The general symptoms are, dyspepsia, flatulence, costiveness, colic pain, pallid complexion, low spirits, a partial paralysis, more especially of the right arm and shoulder, sometimes attended with a severe pain—hepatic cough, and general debility. A removal of the usual

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symptoms, in a case of this kind, by mercury, was succeeded by a permanent *gutta rosea* of the face.

4. *Asthma.* Of the two species of this disease, the humid is often a sympathetic affection. The lungs and liver, separated only by the diaphragm, are intimately associated. The exciting cause of humid asthma is the irritation of a saline mucus lodged in the air cells from deficient absorption. In the case of *torpor hepaticus* it may arise from *direct* sympathy —in *chronic hepatitis* from *reverse.* The laborious respiration and cough are a combination of voluntary and sensitive motion, for the purpose of relieving pain and removing the offending cause. For the sake of illustration, I trust I shall be excused in relating briefly the history of a case most obviously apposite.

Among other marks of an occasional occurrence of chronic hepatitis, or a morbid degree of irritation of the membranes about the liver, the most troublesome was an obtuse pain in the right hypochondre, attended with much anxiety. This succeeded an attack of intermittent fever, during a short residence in a marshy country. The first and most conspicuous associate symptom was a periodical head-ach, generally in the form of hemicrania; commencing with cold chills, and, for the most part, terminating in anorexia and vomiting. This translation of pain was attended with a removal of all sensitive affection from the primary part, and was obviously owing to an increased sensibility and mobility of the membranes about the head, produced by a change of employment from an easy and sedentary life, to the situation of a person constantly exposed to all the vicissitudes of temperature between the extremes of heat and cold. A removal of these causes, by a change of residence, and the inexposure and ease of a city life, with the inconvenience of a frequent inhalation of deleterious gases, has converted this form of disease to a most troublesome *asthma.* That this form of affection results from the original cause (morbid irritation of the hepatic membranes), is rendered probable both by the circumstances attending the occurrence of the paroxysms, and the operation of remedies. That, in this instance, a reverse sympathy obtains between the liver and lungs, is rendered conclusive by the two-fold consideration, that both those causes which produce a direct influence on the former, through the medium of the stomach—as the stimulus of a full meal, acids, aromatics, or wine—as readily and invariably produce its paroxysms as the direct operation of noxious gases on the *lungs*, or the

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sudden exposure of that organ, and also the surface, to a cold and moist atmosphere. Correspondent to the operation of the exciting causes is also the operation of remedies. A diminished excitement of the stomach and liver, by the action of digitalis—a nauseating portion of ipecacuanha—or fifteen hours abstinence—are not less certain in procuring relief than the inhalation of the fumes of tobacco—breathing the warm and dry air of a tight room—or the stimulus of additional flannel to the surface. The most complete relief from this very uncomfortable disease has, of late, been obtained, by taking three grains of *mild muriate of quicksilver* for eight successive days. Does the certain temporary relief derived from the high diffusible stimuli, as opium and camphor, arise from the universality of their operation in dissevering morbid associations, and exciting increased action throughout the system?

5. *Phlegmon of the extremities*, without evident local cause—that species of affection termed *fever-sore—paronychia* and *boils*. Are these frequently substitutes for acute inflammation of the liver, or sympathetic of a chronic disease of that viscus?

6. *Sphacelation of the fleshy parts*, with a caries of the bones of the toes. This curious species of affection, though not of frequent occurrence, is, however, under the usual mode of treatment, as a local disease only, often very troublesome, extending to the metatarsal bones, and gradually wasting the whole foot. Permit me to state, that two cases of this kind, which have come under my inspection, have afforded ample proofs of their hepatic origin. Does the known sympathy between the liver and feet place this affection, as to origin, on the same ground of probability with *gout?* and does the benefit arising from a liberal use of opium in these cases, as recommended by Mr. Pott, result from its high stimulant powers in exciting the healthy actions of a torpid liver?

Among errors in nosology, probably there are none more universal than the opinion that certain symptoms, expressive of hepatic disease in children, denote the existence of worms in the alimentary canal. That those symptoms frequently indicate their existence is well ascertained; but, in a majority of cases, they unequivocally arise from a want of the healthy actions of the liver, of which the existence of worms is only a symptom.

I shall conclude this part of my subject by stating the intimate connection between our mental faculties and enjoyments, and a healthy state of this organ.

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The two great sources of our happiness are the exercise of our intellects, and those healthy operations of our bodies of which we are unconscious, and which, unlike the former, commence with our existence. Reasoning *a posteriori*, we may safely conclude that a very considerable number of the cases of *tædium vitæ* arise from a disordered state of this organ. Our pleasurable and painful sensations so uniformly correspond with the healthy and morbid states of the liver, that they reciprocally excite each other. So sensible of this connection were the ancient writers on medicine, that, by the use of a simple term to express either, they conveyed the complex idea of both: hence the word *melancholia*, from the Greek μελας, *black*, and χολη, *bile*; hence also the term *hypochondriasis*, referring to that region of the abdomen which is the seat of the disease: and when they described a person of an irritable and peevish disposition, they termed him *choleric*, from χολερα, a diseased state of the bile.

Among the causes of hepatic diseases we may count some of the following.

1. Intemperance in the use of spirituous liquors, and other high diffusible stimuli.

2. Intense and constant grief; and a sedentary life, with close study on subjects destitute of amusement.

3. The constant practice of equitation in rough countries; and the swallowing large quantities of cold liquids, with the body previously heated.

4. The practice of too frequent taking of food between the regular periods of meals, and an inordinate use of saccharine and oily food. Does the latter article produce a torpid liver, by destroying the stimulant properties of the gastric juice, from chemical operation? We are told, by the satirical Horace, in describing the caupones of that day, that the Romans possessed the art of enlarging the livers of their fowls to the size of the whole body. This art is practised by the Sicilians of the present day; and it is said to be effected by feeding them liberally with food impregnated with oil.* Common practice prohibits the use of oily food in all cases of troublesome herpetic eruption, of which a great proportion are sympathetic of hepatic affections.

5. Imprudent removal of flannel dress; cold and damp lodgings; and an improper use of the cold bath.

6. Vicissitudes of weather, and change of climate. Amongst

* Vide Zoonomia, vol. i. p. 258.

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European emigrants, no people appear to experience the inconveniences of our climate more sensibly than the Welsh. What should constitute so wide a difference between that people and the Irish, I am not able satisfactorily to explain. The climate of *Wales* is not more temperate, nor the weather less variable, than in *Ireland*. Is this difference to be imputed to diversity in the modes of life, and peculiar national temperaments?

7. The operation of certain *deleterious gases*. Like the case of the clown and violin, an illustration well introduced, on another occasion, by the ingenious Dr. Rush, whenever I view this subject I am obliged to relinquish it with the poor consolation of having only discovered the way leading to hidden treasure. Much light is thrown on it in a *Dissertation on the sympathy of the stomach.** In all cases of *fever*, whether intermittent, remittent, continued, malignant, or yellow fever, and the concomitant diseases of that situation and season most favourable to their production, there are almost invariable marks of an affection of the liver.

Those symptoms usually and improperly denominated *bilious*, and attendant on these fevers, are familiarly spoken of by physicians, without ever attempting their explanation, whether they are to be viewed in the light of cause, effect, or symptom.

As the length of this paper excludes a particular examination of remedies, permit me to notice only two of those articles which admit of more general application, viz. *mercury* and *alkalies*.

If we may be allowed to compare the effects of mercury with that inert practice which accomplishes *nothing;* if an estimation of the effective powers of an article may be drawn from its ability in arresting the shafts of death, whether he approaches with gradual, but certain aim, or, rushing on with gigantic strides, boldly and suddenly stares the unhappy victim in the face—may we not, with some degree of propriety, balance this article with almost the whole of the materia medica in common use? It has, of late, (and without an hyperbole) received the appellation of the *Sampson* among remedies.

The explanation of the *modus operandi* of alkalies, and their more general introduction into practice, especially in fevers, has presented us with a new æra in medicine.

* Vide Medical Repository, vol. v. p. 300.

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That a doctrine so discordant with those taught by most medical writers, and differing so entirely from the habits of thinking and practice of physicians, and which, from its extensive application, must effect so important a revolution in prescription, should meet with opposition, even from men of talents, is so far from militating against its worth, that a contrary reception would excite suspicion of its futility. An attempt to vindicate this doctrine, *a priori*, would be impeaching the well-known talents of its author: nor need I here assert that it is bottomed on the interesting discovery, that a gaseous poison—an oxyd—probably the compound of *septon* and *oxygen*—is a principal agent in the production of pestilence and its kindred diseases. The uniform nature of all the phenomena which constantly meet the eye, and are strikingly exhibited to the notice of every discerning mind, especially in epidemic seasons, conjoined to the practical testimony of a very respectable number of physicians within this city and country, of the great value of alkalies in fever and otherwise, are sufficient to establish it against the cabals of a *host* of European opponents. Consenting even to put in competition with the uniform and striking phenomena of nature, and the most unequivocal facts, the result of chemical analysis, as exhibited by artificial management, what is the conclusion? The experiments of Davy, Fourcroy, and others (even giving full credit to their testimony), amount simply to this: that *nitrous oxyd*, a principle differing materially from the *septic poison* of Dr. Mitchill, when inhaled into the lungs from a pneumatic apparatus, possesses high, and even morbid stimulant properties; and, when applied to dead animal substances, retards putrefaction. To the first of these positions, even granting the identity of the two agents, I shall only state, that the symptoms of yellow fever uniformly evince that the morbid cause is a substance of high stimulant properties, and that the rapid tendency to disorganization is the result of a sudden exhaustion of the powers of life, constituting the indirect debility of Dr. Brown. Were it not too great a digression from this subject, I might trace the analogy between pestilence and the cases of poisoning by *arsenic*, the bites of rabid animals and venomous reptiles, where the morbid cause is known to be a stimulant of the highest grade. As to the objection arising from the antiseptic powers of nitrous acid, at this period of medical improvement, when the two sets of laws which regulate living and dead matter are no longer confounded, it merits not a serious consideration.

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ARTICLE XII.

An ACCOUNT *of several* CASES *of general* DISEASES *cured by the* EXTRACTION *of decayed and diseased* TEETH: *In a Letter to Dr.* EDWARD MILLER, *from* BENJAMIN RUSH, *M. D. &c.*

DEAR SIR;

SOME time in the month of October, 1801, I attended Miss A. C. with a rheumatism in her hip-joint, which yielded, for a while, to the usual remedies for that disease. In the month of November it returned with great violence, accompanied with a severe tooth-ach. Suspecting the rheumatic affection was excited by the pain in her tooth, which was decayed, I directed it to be extracted. The rheumatism immediately left her hip, and she recovered in a few days. She has continued ever since to be free from it.

Soon after this I was consulted by Mrs. J. R. who had been affected for several weeks with dyspepsia and tooth-ach. Her tooth, though no mark of decay appeared in it, was drawn by my advice. The next day she was relieved from her distressing stomach complaints, and has continued ever since to enjoy good health. From the soundness of the *external* part of the tooth and the adjoining gum, there was no reason to suspect a discharge of matter from it had produced the disease in her stomach.

Some time in the year 1801 I was consulted by the father of a young gentleman in Baltimore, who had been affected with epilepsy. I inquired into the state of his teeth, and was informed that several of them in his upper jaw were much decayed. I directed them to be extracted, and advised him afterwards to lose a few ounces of blood at any time when he felt the premonitory symptoms of a recurrence of his fits. He followed my advice; in consequence of which I had lately the pleasure of hearing from his brother that he was perfectly cured.

I have been made happy by discovering that I have only added to the observations of other physicians, in pointing out a connection between the extraction of decayed and diseased teeth, and the cure of general diseases. Several cases of the efficacy of that remedy, in relieving head-ach and vertigo, are mentioned by Dr. Darwin. Dr. Faber relates that Mr.

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Pettit, a celebrated French surgeon, had often cured intermitting fevers which had resisted the bark for months, and even years, by this prescription; and he quotes from his works two cases, the one of consumption, the other of vertigo, both of long continuance, which were suddenly cured by the extraction of two decayed teeth in the former, and of two supernumerary teeth in the latter case.*

In the second number of a late work, entitled, "Bibliotheque Germanique Medico-Chirurgicale," published in Paris, by Dr. Bluver and Dr. Delaroche, there is an account, by Dr. Siebold, of a young woman who had been affected for several months with great inflammation, pain and ulcers in her right upper and lower jaws, at the usual time of the appearance of the catamenia, which, at that period, were always deficient in quantity. Upon inspecting the seats of those morbid affections, the Doctor discovered several of the molares in both jaws to be decayed. He directed them to be drawn, in consequence of which the woman was relieved of her monthly disease in her mouth, and afterwards had a regular discharge of her catamenia.

These facts, though but little attended to, should not surprise us when we recollect how often the most distressing general diseases are brought on by very inconsiderable inlets of morbid excitement into the system. A small tumour, concealed in a fleshy part of the leg, has been known to bring on epilepsy. A trifling wound with a splinter or a nail, even after it has healed, has often induced a fatal tetanus. Worms in the bowels have produced internal dropsy of the brain, and a stone in the kidney has excited the most violent commotions in every part of the system. Many hundred facts of a similar nature are to be met with in the records of medicine.

When we consider how often the teeth, when decayed, are exposed to irritation from hot and cold drinks and aliments, from pressure by mastication, and from the cold air, and how intimate the connection of the mouth is with the whole system, I am disposed to believe they are often the unsuspected causes of general, and particularly of nervous diseases. When we add to the list of those diseases the morbid effects of the acrid and putrid matters which are sometimes discharged from carious teeth, or from ulcers in the gums created by them, also the influence which both have in preventing perfect

* Recherches sur differens Points de Physiologie de Pathologie et de Therapeutique, p. 353—354.

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mastication, and the connection of that animal function with good health, I cannot help thinking but our success in the treatment of all chronic diseases would be very much promoted by directing our inquiries into the state of the teeth in sick people, and by advising their extraction in every case in which they are decayed. It is not necessary that they should be attended with pain, in order to produce disease; for splinters, tumours, and other irritants before mentioned, often bring on disease and death when they give no pain, and are unsuspected as causes of them. This translation of sensation and motion to parts remote from the place where impressions are made, appears in many instances, and seems to depend upon an original law of the animal economy.

Philadelphia, November 22, 1802.

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REVIEW.

ART. I. *A Treatise on Sugar: with Miscellaneous Medical Observations. By* Benjamin Moseley, *M. D. &c. Second Edition, with considerable Additions.* 8vo. pp. 276. *London.* Robinsons. 1800.

THE subjects treated of in this volume bear so many important relations to the United States, that we have no doubt some notice of them will be acceptable to our readers. The author, likewise, from his account of tropical diseases, and of coffee, which a residence of many years in the West-Indies enabled him advantageously to treat, may not improperly be considered as an American writer investigating the products of our soil, and the nature of our diseases.

The first part of the work is devoted to an inquiry concerning *Sugar*. The importance of this great American commodity, in an agricultural, commercial, dietetic and medicinal point of view, is too well known to excite surprise that it should form the subject of nearly two-thirds of the volume. In the first place the author delivers the history of the *Sugar-cane*. To render this the more complete, he seeks for all the information he can find in the ancient writers, from Herodotus down to the destruction of the Roman empire. From this inquiry it seems to result, that the *Sugar-cane*, undoubtedly one of the most valuable plants in the world, is comparatively of modern cultivation. "The ancient Grecians and Romans (says he, p. 126) had no knowledge either of the sugar-cane or of sugar: for there is no mention made of the sugar-cane among the Grecian writers until an hundred years after Hippocrates; nor among the Roman writers until the time of Pompey's expedition into Syria. Sugar is not mentioned by either Grecian or Roman writer until the time of Nero. Neither poet nor historian mentions it in the Augustan age. In the districts of Asia, inhabited by the Hebrews and Israelites, at the time that country was traversed by the Grecians and Romans, sugar was unknown. There is no record among the Jews, even so late as at their dispersion, on this subject." It appears that the sugar-cane was found native in Asia, Africa and America, and that it was brought from the east into Europe at the return of the cru-

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saders. After this account of the cane, he proceeds to give the history of sugar, which has excited many doubts among antiquarians, and is certainly involved in great obscurity. But as this is a point rather curious than practically useful, it is unnecessary to detain the reader by any details. The properties and use of sugar in the next place engage his attention. He commends it, in high terms, as an article of food, and considers it as the basis of all vegetable nutrition. He does not seem to assent to the opinion of its producing the decay of teeth; and is so far from believing that it promotes the generation of worms in children, that he is confident it tends to destroy and expel them.

After his account of sugar, the author offers some remarks on the *Cow-pox*, which, at that early stage of the discovery, he was disposed to reject as a useless and dangerous innovation on the practice of inoculating the small-pox. We entertain, however, no doubt that subsequent experience has effected a complete conviction of the error which he had inadvertently adopted on this subject.

Some observations on the *Yaws* follow next in order. But in this part of the work we meet with little that can be accounted new or memorable.

Under the head of *Obi*, a species of witchcraft prevailing among the blacks in the West-Indies, which he traces to Africa, and supposes to have originated among the ancient Egyptians, the author exhibits many curious facts.

The *Plague* in the next place engages Dr. Moseley's attention. He rejects, in decided and energetic terms, the old medical superstition and credulity, which assign the origin of pestilence to a contagion exported and imported from one part of the world to another. But on this subject we think it expedient to let the author speak for himself.

"The idea of the American plague being imported from *Bulam*, or the West-Indian islands, or any other place, is repugnant to reason. I was told a similar tale when I first went to the West-Indies; that the *yellow* fever there was imported in the beginning of the century from *Siam*; that it was a contagious, and an original putrid disease; and that bleeding was death. In my practice I proved the reverse of all this.

"The cause of pestilential epidemics cannot be confined and local. It must lie in the atmosphere which surrounds and is in contact with every part of us, and in which we are immersed as bodies in fluids.

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"These diseases not appearing in villages and thinly inhabited places, and generally attacking only great towns and cities, may be, that the atmosphere, which I conceive to be the universal propagator of pestilence, wants a commixture or union with some compounded and peculiar air, such as is generated in populous communities, to release its imprisoned virulence, and give it force. Like the divided seminal principles of many plants, concealed in winds and rains, until they find suitable materials and soil to unite their separated atoms; they then assume visible forms in their own proper vegetation.

"Diseases originating in the atmosphere seize some and pass by others, and act exclusively on bodies graduated to receive their impressions; otherwise whole nations would be destroyed. In some constitutions of the body the access is easy, in some difficult, and in others impossible.

"The air of confined places may be so vitiated as to be unfit for the purposes of the healthy existence of any person. Hence jail, hospital, and ship fevers. But as these distempers are the offspring of a local cause, that local cause, and not the distempered people, communicates the disease.

"I know it is thought otherwise by Fracastorius, the inventor of contagion, and his followers.

"Plagues and pestilences, the produce of the great atmosphere, are conveyed in the same manner, by the body being in contact with the cause, and not by its being in contact with the effect.

"If pestilences were propagated by contagion from infected persons, the infection must issue from their breath or excrements, or from the exhalations of the bodies of the diseased.

"In support of the last circumstance, the Black Assizes at Oxford, in 1577, has been often instanced by authors; and that the judges, jury and attendants, were destroyed by the infection brought into the court by the prisoners. How could this be when the prisoners were not ill themselves?

"Insulating the sick, and debarring all intercourse with them, according to the doctrine of contagion, would bound and stop the spreading of diseases.

"This was tried at Marseilles, in 1721, without effect. The Capuchins, the Jesuits, the Recollets, &c. who kept themselves secluded in their several convents, and took every precaution against all communication from without, perished equally with others by the plague.

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"The infection, if it were not in the atmosphere, would be confined within very narrow limits—have a determinate sphere of action—and none but physicians and attendants on the sick would suffer, and these must suffer; and the cause and the effects would be palpable to our senses. Upon this ground the precaution of quarantine would be rational. But who, then, would visit and attend the sick, or could live in hospitals, prisons and lazarettos?

"In confirmation of what I have lately and now said, and what I many years ago advanced respecting contagion and infection in pestilential fevers, a very important fact, resulting from Bonaparte's expedition into Syria in the beginning of 1799, has, within these few weeks, appeared, which will not be passed unnoticed by judicious physicians.

"Berthier, in his account of that expedition, says, 'At the time of our entry into Syria all the towns were infected by the plague, a malady which ignorance and barbarity render so fatal in the east.

'Those who are affected by it give themselves up for dead; they are immediately abandoned by every body, and are left to die, when they might have been saved by medicine and attention.

'Citizen Degenettes, principal physician to the army, displayed a courage and character which entitle him to the national gratitude.

'When our soldiers were attacked by the least fever, it was supposed that they had caught the plague, and these maladies were confounded. The fever hospitals were abandoned by the officers of health, and their attendants. Citizen Degenettes repaired, in person, to the hospitals, visited all the patients, felt the glandular swellings, dressed them, declared and maintained that the distemper was not the plague, but a malignant fever with glandular swellings,* which might easily be cured by attention, and keeping the patient's mind easy.

'He even carried his courage so far as to make two incisions, and to inoculate the suppurated matter from one of these buboes above his breast, and under his arm-pits, but was not affected with the malady.

'He eased the minds of the soldiers, the first step to a cure; and, by his assiduity and constant attendance in the hospitals, a number of men attacked with the plague were cured. His example was followed by other officers of health.

* "Degenettes' views in making this distinction were highly commendable; but certainly this fever was the plague."

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'The lives of a number of men, Citizen Degehettes was thus instrumental of saving.

'He dismissed those who had been ill with the fever and buboes, without the least contagion being communicated to the army.'

"From the medical men of letters on that expedition much more may be expected as to the treatment of the plague; and I understand that the world will soon be gratified on this subject by Berthollet and his coadjutors.

"Importing plagues, like the existence of contagion in pestilential fevers, is contrary to the opinion I ever had, and still maintain.

"From whence was the importation of the plague at Naples in 1656, by which 20,000 people died in one day?

"Can any person, for a moment reflecting, believe that the great plague of London, in 1665, which imagination traced from the Levant to Holland, and from Holland to England, was caused by opening a bag of cotton in the city, or in Long Acre; or a package of hemp in St. Giles' parish?

"Is it possible to suppose that people should have been found to propagate or believe the well-known and favourite story of the advocates for Mead's theories—that a lady was killed instantly by smelling at a Turkey handkerchief, and a gentleman by only walking over a Turkey carpet!

"One might ask, What became of the persons who delivered the handkerchief to the lady, and laid down the carpet for the gentleman?

"How was the infection carried to the interior of Tartary, where it made its irruption on the world in 1346?

"It is said that this plague depopulated two hundred leagues of that country, and destroyed serpents, birds, insects, and even trees. It spread to other parts of Asia and the East-Indies, and into Africa, Egypt, Syria, Greece, and the islands in the Levant, and, at length, into every part of Europe; and continued its devastations, in different countries, for the space of five years.

"I have seen almost all the lazarettos, hospitals and prisons in Europe. The worst governments abroad most abound with this splendid inheritance of paupers and criminals—the children of bad state-parents.

"Even in these false, cheating monuments of superstition, these impositions on credulity and benevolence, where pomp and magnificence are pictured without, and neglect, dirt, misery, and often malicious oppression, found within, I never

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could discover that fevers are propagated by contagion. Were it possible so to be, I should have been long since dead.

"Quarantine, always expensive to commerce, and often ruinous to individuals, is a reflection on the good sense of countries.

"No pestilential or pandemic fever was ever imported or exported; and I have always considered the fumigating ship-letters, and shutting up the crews and passengers of vessels, on their arrival from foreign places, several weeks, for fear they should give diseases to others which they have not themselves, as an ignorant, barbarous custom.

"Speaking thus decidedly against the general opinion and practice, I may possibly incur the imputation of rashness from the timid—from those who believe in their fears—and from some who adopt opinions on tradition, without examination. But these are my sentiments. This is the way I take to serve my country, regardless of the narrow notions of vulgar prejudice: for, from what has lately occurred in our metropolis, it is not difficult to foresee, should the plague, or any pestilential fever like the plague, appear, how distress and misery would multiply, through false alarms, misrepresentations, ignorance and imposition."

The volume is concluded with some remarks on *bronchocele*, and on the *hospitals* and *prisons* which the author had visited in the course of an extensive tour through the continent of Europe.

ART. II. *An Essay on the Malignant Pestilential Fever, introduced into the West-Indian Islands from Boullam, on the Coast of Guinea, as it appeared in* 1793, 1794, 1795, *and* 1796. *Interspersed with Observations and Facts, tending to prove that the Epidemic existing at Philadelphia, New-York, &c. was the same Fever, introduced by infection, imported from the West-India Islands: and illustrated by Evidences founded on the State of those Islands, and the Information of the most eminent Practitioners residing on them. By* C. Chisholm, *M. D. and Inspector-General of the Ordnance Medical Department in the West-Indies. The second Edition, much enlarged.* 2 *vols.* 8vo. *London.* Mawman. 1801.

THE occurrences in the United States, relative to pestilential diseases, within the last ten years, have given an unexpected degree of importance to medical publications by

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physicians of the West-Indies. The opinion held by some persons among us, that malignant fevers of the summer and autumn derive their origin from foreign contagion, which they suppose to be imported through commercial channels, and thence to be diffused from one person to another in our sea-port towns, naturally leads to a closer investigation of the diseases of the islands said to produce this contagion, and to a more attentive perusal of the writings of such physicians as have been there instructed by actual experience. If pestilence be transmitted from one country to another, like a bale of merchandize, it is necessary to trace its course at every stage of the passage, and to ascertain all the circumstances which favour or impede its arrival amongst us. It is unnecessary, therefore, to offer any apology for the account we now give of a publication from a foreign press; as our readers cannot fail to acknowledge the interest which every commercial town in the United States must feel on the subject of these volumes.

We are particularly desirous to draw the public attention to this work, although we entirely dissent from the author's opinion concerning the origin and propagation of the disease in question. Dr. Chisholm is a very respectable writer, and treats the subject of his work in a masterly manner. The contagionists and importers of yellow fever in this country would do well, as far as their powers extend, to pursue the example of this great defender of their doctrine. The dullness and feebleness which hitherto have pervaded all their attempts to support their opinions by argument, are often lamented by the more intelligent among themselves, and never fail to injure the cause they undertake to advance. This must be ascribed not only to the radical defects of these writers themselves, who attempt to carry a burden which their strength was never destined to bear, but likewise to an indolent unacquaintance with the information and assistance they might readily obtain from the work before us. We ardently hope to see a reformation on this point. We are sincerely anxious to see the doctrine we reject set in the best light it is capable of receiving, in order that the question may be brought the more speedily to a fair and ultimate decision. Let the contagionists and importers of pestilence in the United States cease, then, to rely on their own powers, which so repeatedly have disappointed and destroyed their hopes. Let them no longer fatigue the public with a reiteration of the crude and inconclusive reasonings, and of the mistated and inapplicable

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facts, which experience has so frequently proved to be incompetent to sustain their sinking cause. Let them be persuaded, in a word, instead of this unavailing reliance on their own resources, to "give their days and nights" to the study of *Chisholm*, from whose sterling bullion of a single page they may draw wire enough to glitter through annual pamphlets without end.

It will be kept in the remembrance of the reader that this is a second edition of Dr. C.'s work; and that, while he retains nearly the whole of what appeared in the first edition, he has rendered this much more ample and comprehensive. In the preface to this new edition he states the motives which induced him to lay it before the public in an enlarged form, and vindicates himself from certain charges of mistatements and improper designs in the execution of his original work. In our judgment he entirely exculpates himself from the charges of sinister motives and wilful mistatement. And, notwithstanding the broad ground on which we differ with Dr. C. we are happy in this opportunity to acknowledge our conviction of the purity of his intentions, of his zeal for the public welfare and the advancement of medical knowledge, as well as of the eminent abilities which he displays in this work.

In the execution of his plan, the author has thrown the materials of the work into four parts. The first contains an account of the origin, progress, diagnostic, causes, and other circumstances of the pathology of the disease; each of which is treated of in a distinct chapter. The second part relates to the means of cure, and is divided into five chapters; of which the three former are appropriated to the discussion of the three general indications of cure, and the fourth is employed in the investigation of the principles on which the efficacy of mercury in the fevers of hot climates in general, and more especially in what the author calls the malignant pestilential and yellow remittent fevers, is founded; the fifth is devoted to observations on the action of oxygenated medicines on the system, deranged by fever and other morbid affections in hot climates. The third part is allotted to the important investigation of the means of prevention. And the fourth part is intended to exhibit proofs and illustrations of infection imported into the West-India Islands, and the colony of Demerary in South-America, during the years 1793, 1794, 1795, and 1796. An appendix, containing miscellaneous matters, is also subjoined.

Our limits do not permit us to go into a particular exa-

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mination of many opinions and inferences from facts, in which, as we believe, Dr. C. has fallen into material error. This is the less necessary, as many of the points of opinion in which we think differently from him have been ably discussed by our late ever-to-be-lamented colleague Dr. E. H. Smith.* In the paper here referred to, it is plainly seen how many important facts, which are stated by Dr. C. himself, when carefully examined, lead to conclusions diametrically opposite to those which he intended to support.

In the consideration of this work, *contagion* is the grand and fundamental point of controversy. Importation must stand or fall with this power on which it necessarily depends.

The contagionists and importers of yellow fever, in order to maintain their hypothesis, are driven to an interpretation of facts, which, if admitted, would enlarge the number of contagious diseases beyond all the bounds of reason and experience. When yellow fever prevails in our cities, it is matter of familiar observation, that a person ill of that disease, by going to the country, communicates no contagion to such as approach his bed. A very few instances of a contrary result have been asserted to take place; most of these, however, upon due inquiry, have been proved to be unfounded. We will suppose, for the sake of argument, and out of respect for those who make the assertion, that some rare cases of this sort have seemed to occur. But what is to be inferred from such rare cases? not that the disease is really contagious; or else we must equally conclude that *phthisis pulmonalis* is contagious, against the clear and uniform decision of experience, and the authority of the most respectable observers. Dr. Beddoes relates the following facts, quoted from a publication of Dr. Luzuriaga. "A nun died at Bilboa of consumption. The furniture was burned; the walls, ceiling and door washed; the floor taken up, and sand laid in its place. The cell was then tenanted by another nun, in perfect health, and of an excellent constitution. In two months she began to decline; her flesh wasted; the chest was attacked; the cough became worse and worse; in short, she died consumptive, in eight months after taking possession of the cell. General purification as before. It was supposed the disease was hereditary in the last case. A third healthy nun succeeded, and died in the course of the year. New examinations took place, and it appeared that the cord near the bed, attached to

* See our vol. i. p. 429, second edit.

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the dropping bolt of the door, had not been removed. This, it is said, was impregnated with the sweats of the patients, and with other noxious exhalations. It was removed; new furniture introduced; and a fourth has lived in the same cell for five years. In Italy there is the story of a beautiful pair of gloves worn by a first wife, and alone of all her appurtenances not destroyed upon her dying consumptive. Long after, a second wife spies the gloves, wears them, and perishes like their former owner." Notwithstanding these facts, Dr. Beddoes, in our judgment very judiciously, thus treats the question—"Is consumption catching? *Yes*, answer the writers of the south, with great consent, though not unanimously. The writers of the north say *No*. To our comfort, the former are either dupes to the phantoms of their own imagination, or their facts do not apply to us. We are certain that furniture and apparel, more bulky than bolt-ropes and gloves, and certainly not less likely to foster the matter of phthisical contagion, has no such effect with us. In any country, is not accidental succession more probable?"* In this opinion we have no doubt that Dr. Beddoes is supported by all the most respectable physicians in Great-Britain. And the experience of no country on earth can be deemed more authoritative than that of Great-Britain on this question; as no where else does consumption prevail so much, or commit such ravages.

We have been at the pains to state the above-mentioned facts, and the explanation of them, with the view to show how easily fallacies may be admitted on the subject of contagion. Most of the few instances of pestilential disease, in which contagion might be plausibly alleged, rest on no better foundation than the stories of phthisical contagion from the bolt-ropes and gloves in Spain and Italy. Indeed, the evidence with respect to the contagion of consumption seems to stand on stronger ground than that of yellow fever or other epidemic pestilence. While the latter is laying waste one of our cities, during the summer or autumn, it is well known that all persons, whether in town or country, and even such as apparently enjoy good health, are more generally disposed to take on febrile action than at other seasons of the year. It will therefore happen, at such times, not only that a slight exciting cause will be sufficient to induce disease, but that accidental coincidences of diseases will be more frequently ob-

* Essays on Health. Essay vii. p. 95.

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served. The remarks here made are intended to be applied merely to those rare cases of contagion alleged to take place in consequence of the removal of the sick into the country adjacent to a town under the ravages of pestilence; for as to the spreading of such disease within the range of contaminated air in the city itself, it proves nothing more of the existence of contagion than the spreading of intermittents in the neighbourhood of a marsh.

In this view of the subject, it will be distinctly seen that Dr. C.'s cases of alleged contagion, beyond the range of air known and acknowledged to be peculiarly corrupted, are liable to the strongest exception. When, out of five hundred instances of exposure to this pretended contagion, only two or three individuals are said to be struck, and all the rest escape unhurt, what must be our conclusion? Is not the conclusion inevitable, where the negative instances present such a vast predominance over the positive, that the few positive ones are the result of accidental coincidence or succession, or of some other causes equally remote from contagion, which, if it were necessary, might be readily enumerated?

ART. III. *A Concise History of the Autumnal Fever which prevailed in the Borough of Wilmington in the Year* 1802. *By Dr.* John Vaughan. 8vo. pp. 32. *Wilmington (Del.)* Wilson. 1803.

A MANUSCRIPT account of this distemper at Wilmington was sent, as we have understood, to Philadelphia for publication. The author was led to believe it would have been inserted entire in a collection of essays then preparing for the press. But he was much disappointed to find that "a mutilated abstract only was published." After having asked some explanation from his correspondents concerning this manner of treating his performance, and obtaining but little satisfaction, he resolved to do himself justice by printing the whole under his own eye.

Though this is a short, it is an intelligent account of a disease which afflicted the place in which the writer resides, in the fall of 1802. It is a valuable piece of local medical history, drawn up by a physician who describes what he saw, and who lived through the scenes of calamity and terror which he witnessed. Dr. Vaughan has, however, not confined himself to a mere delineation of symptoms, and a re-

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cital of prescriptions; he investigates the origin and progress of the malady, and endeavours to trace it to some external or internal source. He declares that, with all his vigilance, he cannot discover it to have been brought from any place whatever, either by water or by land, by persons or by goods. He examines, with care, the allegations against a young woman and a schooner, charged with having *imported contagion* into Wilmington; the former from Philadelphia, and the latter from Port Republican; and finds them quite unfounded in reality, no better supported than similar tales usually are. But we shall give Dr. V.'s own words. (p. 15.)

"On a review of the preceding narrative, it appears that the disease took rise in the narrow part of King-street and the adjacent district, progressing, with irregular steps, over the lower parts of the town, and finally encroaching on the district north of Third-street; but was principally confined to the district south-east of Market and Third streets.

"The more prominent facts relating to the origin of the disease stand thus:—1. Ann Davidson, the only person who was or could be suspected of introducing contagion among us, came from Philadelphia in the beginning of August, to her father's house in King-street, and was reported to be affected with contagious fever on the 15th. She recovered, without suffering any of the more violent symptoms of malignant disease, and removed into the country.

"2. The family in which she resided consisted of ten persons, all of whom remained well until the 7th of September, when her mother had an attack of fever, after a journey of ten miles into the country, performed partly on foot, and partly in an open cart.

"3. In the mean time, T. Musgrove's son, Ann Hadley, Capt. West's girl, Mr. Cloud, and Hannah Robinson, in the same square; and R. Hagin's son, J. Warner's girl, E. Dale, and others, in different directions, were attacked with malignant fever.

"4. If Ann Davidson's disease were contagious, and the only source of future disease, is it not reasonable to suppose that some one or more of the ten persons, confined in a small house with her, would have been the first affected by the contagion? The reverse was the fact.

"5. The first serious alarm of malignant fever took place in the first week of September. The cases were principally, but not altogether, confined to King-street. The square between Second and Front streets, whose filthy cellars *was* a mat-

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ter of notoriety, and a subject of common complaint, was the more concentrated seat of disease.

" 6. The cases specified evince a correspondency of dates indicating the action of a common cause, and precluding the more slow and successive routine of human contagion, from one diseased person to another.

" 7. The disease was suspended by the great change of weather which took place on the 5th of September, and resumed a formidable shape about the 9th, and became general in the southern district against the 25th of the month.

" 8. When the disease became alarming a second time, I personally inquired into the preliminary circumstances of every case that occurred, for the purpose of tracing their origin; and none of them could be reasonably imputed to contagion from the previously sick.

" 9. The disease was evidently subservient to the states of the weather, in declining in frequency and force in warm clear weather, and re-assuming a formidable shape on every change to coolness and moisture of the atmosphere.

" On the most liberal view which can be taken of the rise and progress of the disease, with an unrestrained examination of the facts, as they occurred, I see no reason to suppose the insidious malady was of foreign origin, or specifically contagious. On the contrary, I am firmly impressed with the belief, that it was the endemic fever of autumn aggravated to a pestilential grade, by local filth, and the tropical state of the season, in conjunction with an epidemical state of atmosphere, which appears to have influenced the diseases of our country since the memorable year 1793. This belief is further predicated on the following facts and inferences.

" 1. An epidemical state of atmosphere, favouring the occurrence of malignant fever, was evinced by the usual premonitory forms of disease.

" The measles were epidemic in the fall of 1801, and declined during the winter, giving place to the scarlet fever. The last winter was unusually mild, which gave birth to swellings of the glands, croup, and the influenza, in April and May, 1802. June was, as usual, comparatively healthy, but chequered with some cases of cutaneous disease. In July the putrid sore-throat occasioned considerable alarm; and, during the latter part of July and early part of August, the eruptive state of fever was extremely afflicting to children, and seemed to supercede the ordinary appearance of cholera infantum. In some cases general ulceration of the glands of the neck and

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malia were so obstinate as to require a complete course of alterative remedies.

"2. The season became tropical in the middle of August. The weather, from being uncommonly cool, suddenly became extremely hot, varying from 80 to 90 deg. with frequent gusts of rain and lightning. In the evenings of the 29th, 30th, and 31st, there were excessively violent thunder-storms from the westward, with torrents of rain. It was remarkable, during the autumn, that all our sudden and violent rains came from the westward, and commonly extended but a few miles along the Delaware. In misty weather the wind was mostly north-east. But the winds were unusually variable, not unfrequently traversing the compass in twenty-four hours. The changes of the weather were proportionally sudden.

"3. Myriads of musquitoes infested the lower parts of the town from July until frost, having gradually diffused themselves over the borough in September. The eldest of our inhabitants do not recollect this insect's being troublesome here in any previous season; while the unanimous report of persons from the fenny counties of Kent and Sussex, the annual haunts of these winged pests, was, that they were unusually free from them.

"4. The sources of noxious effluvia in the southern and flat part of the town were much increased by a regulation, but partially executed, for bringing the streets to an uniform descent from the summit of the hill. A number of cellars were filled with water; a new dock formed; and the gutters lowered in some places and raised in others, forming numerous depositories of filth. These circumstances, added to the nuisance in King-street, rendered the air of that quarter offensive to the smell in the day-time, and doubly so at night. After the 15th of September the air had a taint resembling bilge-water, especially after a light shower of rain and in the night, and more sensibly recognized by persons coming immediately from a higher region.

"5. The fogs which collected in the evenings were suspended on the flats during the nights, gradually becoming more compact in the mornings, and mostly passed off in a dense cloud towards the Delaware, between seven and ten o'clock. This semi-circuit of the fogs, from Market-street southward and eastward, was the seat of concentrated disease. Those fogs were condensed miasmata of fever in a familiar garb.

"The seat of disease was so well defined until the 15th of

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October, that the inhabitants north of Third-street felt but little apprehension; and, as the fogs became diffused, a few scattering cases of disease appeared, and removal was the only mean of safety.

"6. The poisonous matter exciting disease was evidently a constituent part of the fogs. Many persons visited the infected district in clear weather, and in the day-time, without injury, and several of the same persons contracted disease by a single exposure in the night-time, after the fog had collected. It also is remarkable, that the disease generally attacked in the night-time.

"7. The non-contagious nature of the disease was repeatedly attested by persons sickening after removal from the lower to the higher parts of the town, and being nursed with every attention, and dying without communicating the malady to their attendants. Also, two sailors had the disease, on board of different vessels, at separate wharves, without affecting their companions.

"It is not denied that the more malignant cases of disease may be incidentally contagious, or rather re-infectious, under circumstances favouring a new chemical combination of the venomous offsprings of filth and putrefaction.

"8. A noxious state of atmosphere was manifested by the lingering state of convalescents who remained in the contaminated region, while those who removed into the country were speedily restored to health.

"9. The indigenous nature of the disease was evidently characterised by the ultimate sameness of every form and grade of fever. After the middle of September, the subordinate forms and grades of fever, not arrested within 48 or 72 hours, invariably passed on to the malignant grade of disease. No matter how slight the attack, nor who the subject, the livery of pestilence sooner or later appeared: and valetudinarians, cases of pulmonary consumption excepted, suffered in the common fatality.

"Lastly. The rise, progress, and confined state of the disease; the manner in which the fluctuating malady corresponded with the varying states of the weather; the non-communication of disease to the attendants on the sick, when out of the original sphere of infection; and the sporadic appearance of disease in other parts, after the more extended fog on the fifteenth of October; with the final termination of the progress of infection by a single frost—are, in my opinion, evidences striking as the nature of the case will pos-

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sibly admit, that the multiform disease which afflicted us was not of foreign origin, nor specifically contagious.

"Believing that a proper attention to the internal condition of this borough, and preserving the adjacent marshes in their present state of cultivation and improvement, by numerous drains, would be the surest means, under Providence, of securing us against a repetition of the calamity,

"I am, gentlemen, with sentiments," &c.

We think Dr. V. is entitled to much credit for the impartiality and intrepidity he has shown, and we hope his conduct will be an example to other gentlemen in the profession to observe, and relate what they shall see, with equal fidelity. We shall thus, by degrees, correct a considerable part of the errors which overhang the history of febrile distempers.

ART. IV. *An Essay on the Mineral Properties of the Sweet Springs of Virginia, and Conjectures respecting the Processes of their Production by Nature; together with Hints relative to an Artificial Formation of similar Medicinal Waters: to which are added a few concise Strictures on a Treatise composed by* John Rouelle, *M. D. on the same Subject. By Dr.* John Baltzell, *Frederick-Town, Maryland.* 8vo. pp. 30. *Baltimore.* Warner & Hanna. 1802.

THE Sweet Springs in Virginia, like those near Ball's-town and at Lebanon, in New-York, are become a place of very fashionable resort. Both the healthy and the valetudinarian frequent them, during the warm season, in great numbers. They have therefore become so much the subject of conversation, that it is now very desirable to know the chemical history of the waters themselves, and the topographical account of the region which they irrigate.

We remember to have seen, some years ago, in Carey's *American Museum*, if we recollect right, some experiments on these waters, by J. Madison, Esq. These, if we are not mistaken, were copied from the second volume of the *Philosophical Transactions.* Dr. Rouelle published certain experiments on them in 1792; and on these the author makes criticisms and strictures in the postscript to the present pamphlet.

Dr. Baltzell does not appear to have visited the springs themselves: he therefore has not the advantage of an observer upon the spot. His experiments were not made upon the water recently drawn from the fountain, but upon the fluid, "conveyed to Frederick-town, in Maryland, in a bottle well corked

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while immersed in the springs, and further secured by sealing-wax to prevent the escape of the aëriform principles."

The pamphlet now under review contains the description of the Sweet Spring water, and the experiments made upon it by Dr. B. as he received it, after transportation miles. This account will be best understood in his own words:

"It is very limpid and clear, and to my tongue has an astringent subacid taste. Its transparency evinces, how perfectly it holds its mineral properties in solution: I could not discover that it deposited any sort of sediment in the bottle, and observed no discolouration, by which it might be distinguished from common spring water. Several wine-glasses were used on the occasion, in which the experiments were separately conducted; and the effects of each TEST were carefully distinguished and ascertained. The results were as follow:—

"*Exp.* 1st. A few drops of the muriate of barytes, let fall into some of this water, yielded a white cloud; an infallible evidence, that the sulphuric acid is one of its mineral principles. Such is the attraction of the barytes for the sulphuric acid, that the latter seizes the former in whatever combination it is presented to it, and forms an insoluble compound, called sulphate of barytes or ponderous spar.

"2d. The prussiate of lime, being dropped into some of it, afforded the prussiate of iron or Prussian blue, with a quantity of rust-coloured matter of less specific gravity. This indubitably detects the presence of iron. The prussic acid, seizing on the iron, produces the prussian blue; while the sulphuric acid of the martial vitriol, seizing on the lime, disengages the iron; which, not finding sufficient prussic acid to unite with, falls down in the state of calx or oxyd. I suspect also, that some of the carbonic acid gas abandons its union with the iron, and makes its escape in an elastic form in this experiment.

"3d. A solution of carbonate of potash, being poured into it, produced a white precipitate. This solution being a test whereby to discover as well the combination of magnesia with the sulphuric acid, as that of alumine or pure clay with the same acid, we were determined, by our taste, to believe it to be the alum. The potash seizes on the sulphuric acid, while the carbonate of alumine is precipitated. The magnesia turns the tincture of turnsole of a slight green: an evaporation of the water from the precipitate, and repeatedly washing it with distilled water, and after calcining it to dissipate the carbonic acid, subjecting it to the test, would ascertain the presence of magnesia, if doubts were entertained as to the alumine.

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"4th. The oxalic acid, dropped into it, yielded a white precipitate, which demonstrates the presence of lime, as the acid seizes on lime in all combinations forming an insoluble compound, called the oxalate of lime.

"5th. The nitrate of silver, or solution of silver in the nitrous acid, produced a small luna cornea, like a white cloud in the water; indicating a small portion of muriatic acid or spirit of sea salt united to some base. In this experiment the muriatic acid seizes the silver from the nitrous acid, on account of a stronger affinity, forming the luna cornea; while the nitrous acid attacks its base, forming some compound, perhaps nitrate of soda.

"The foregoing are the fixed mineral properties, which were detected in the manner we have described; two volatile principles, of a distinct nature and quality, were also discovered to be contained in this water.

"*Exp.* 6. A few drops of a solution of caustic lime being let fall into it, yielded a white precipitate. The lime is seized by the carbonic acid gas, or fixed air, which appears to be in this water in considerable quantity: this precipitate is the carbonate of lime.

"7th. By writing on clean white paper with a solution of acetite of lead or saccharum saturni, and confining it over this water, poured out and agitated in a wine-glass, the letters turned of a dark ferruginous hue; showing, beyond the possibility of a doubt, that it holds, suspended in it, a quantity of the sulphurated hydrogen gas:—The hepatic smell is an additional proof, if it needed any, of the presence of this gas in the water.

"If any one be disposed to perform experiments with this gas, he may obtain it, by pouring muriatic acid, or any other acid, or the hepar sulphuris, or liver of sulphur: by this the solution of sugar of lead becomes an elegant sympathetic ink.

"8th. The alcohol of galls poured into this water produced no change: owing probably to my not employing enough of the infusion, or perhaps to the superabundant fixed air in it.

"9th. The solution of ammoniac or aqua ammoniæ, which is used to detect copper, mixed with it, without effecting any alteration in the appearance. We had not a sufficient quantity of the spring water to attempt a further analysis, by the process of exaporation; in which case, the fixed saline and earthy principles might have been subjected to tests, applied in different forms.

"The accuracy of discovering the mineral properties of

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waters by re-agents, being called in question by several chemical writers, and this being the only method at present in our power, I thought it necessary to essay this method, by synthesis, in artificial solutions of alum and copperas: I accordingly made a solution of copperas and of alum, in separate phials, and performed the following experiments with the same tests, which I employed to detect the fixed mineral properties of the Sweet Spring water.

"*Exp.* 1st. I poured a part of the two solutions together, and, into this mixture, I dropped the prussiate of lime; when a beautiful Prussian blue diffused itself throughout, without yielding any kind of rust-coloured precipitate; which circumstance further confirmed me in my reasoning on that experiment and in the persuasion of the presence of carbonated iron ore in the natural mineral waters.

"2d. The muriate of barytes, dropped into this mixture, produced a heavy precipitate, the sulphate of barytes or ponderous spar.

"3d. A solution of carbonate of potash, poured into a solution of copperas, precipitated a ferruginous sediment. But,

"4th. Being poured into a mixture of the two solutions, it yielded a white precipitate, as it does in the water of the Sweet Springs: this, I was positive, could be nothing else but the carbonate of alumine.

"I have fully stated, in the preceding pages, the experiments and manner of conducting them; as also the grounds and reasons of my conclusions: I have endeavoured to exhibit a complete view of the processes of my analysis for the critical inspection of such chemists as may be disposed to examine its merits, or improve the method I employed in conducting it. The striking coincidence of the results of my synthetical experiments with those performed on the natural mineral waters appears to me a strong demonstration in favour of my conclusions; according to which the water of the Sweet Springs contains the following mineral properties:

"Carbonated iron ore, Copperas, Alum, Fixed air, Sulphated hydrogen gas, Carbonate of lime, and the Muriatic acid united to some earthy or alkaline base, perhaps soda, in a very small proportion: these two last, carbonate of lime and the muriate, are also found in various quantities in the well waters of Frederick-Town, and, I suppose, bear no part in the medicinal virtues of the Sweet Springs.

"I would not venture to assert, that these are all the mineral principles contained in the water of the Sweet Springs: it

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would require a nice experimental investigation, conducted at the spot, and frequently repeated in every modification, before that could be confidently pronounced: I have confessed my ignorance of the base of the muriatic acid, and, in the subsequent part of my observations, I have conjectured, that there may also exist a portion of sulphate of lime or selenite in the waters, on grounds which are there stated. A quantity of the water, conveyed in a bottle holding about two pounds, must have been considerably agitated in a journey of upwards of two hundred miles: the aëriform principles would naturally rise in an elastic state, ready to escape on drawing the cork; and we were sure, that part of them did escape, from the whizzing noise produced on giving vent, when it was opened for the purpose of experimenting; consequently, nothing definite could be advanced as to their quantity and proportion in the water, as it is drank at the Spring-head, where, however, these, as well as the fixed mineral properties must always vary, according to the quantity of rain that falls, and the humidity, dryness and temperature of the atmosphere. We did not attempt to ascertain its specific gravity, which was omitted as a matter of little importance; since it could not have been estemed accurate, on account of the escape of part of the volatile principles: and the temperature of the water must be determined by a thermometer immersed in it at the fountain head.

The temperature and specific gravity of the Sweet Spring water was ascertained by J. MADISON, Esq. who communicated an account of the experiments in a letter to Dr. RITTENHOUSE; which was published in the 2d vol. of the Transactions of the American Philosophical Society, of which the following is extracted.

"*Exp.* 1*st.* 'Having plunged a very sensible mercurial thermometer in the Spring, it stood at 73 deg. the temperature of air was about 69 deg.

"2d. 'A good hydrometer sunk one-twentieth of an inch deeper in common mountain water than in the spring."

It would give us great pleasure to see a correct and detailed account of the region in Virginia where the springs exist, and of the waters themselves. And we entertain the hope, that Dr. B. who has done so well with a bottle of the water brought a considerable distance, will take an early opportunity of travelling to that genteel place of resort, and of observing, at fountain head, whatever shall present itself to the eye of the chemist and natural historian.

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ART. V. *The Charleston Medical Register, for the Year 1802. By* David Ramsay, *M. D.* 12mo. pp. 22. *Charleston (S. C.)* Young. 1802.

THE author of this pamphlet has been long so respectably known to the people of the United States as a writer and a practitioner of medicine, that to announce a publication from his pen will be sufficient to excite the attention of our readers. We are exceedingly pleased with the plan of this Register, which comprises within a small compass a variety of important notices of subjects pertaining to medicine, and leaves us nothing to regret but the brevity with which some of them are treated. So highly prized are the abilities and experience of Dr. Ramsay, that whatever the pressure of his multiplied avocations compels him to curtail or to postpone in a performance of this kind, is felt by the public like the privation of a benefit to which a claim had been formally entered.

A view of the plan and objects of this Register will appear from the introduction prefixed to it, which we give in the words of the author:

"Medical facts, correctly stated and diligently compared together, reflect great light on the practice of physic. Conformable to this established principle, it must be obvious, that annual statements of the principal events connected with the health of the inhabitants, made by physicians in different places, would be particularly useful. The more extensively this was done, the better; but in the United States the advantages of such publications are enforced by peculiar considerations. In the old world the attention of learned men has been employed, for many centuries, in applying the general principles of medical science to the local peculiarities of each particular spot. Knowledge of this kind, in America, chiefly rests with individuals. To bring it within the reach of the community, requires the joint labours of practitioners in every part. If one physician, in each of the cities and towns of the United States, and several in the country parts of each state, were to favour the public with an annual account of the state of diseases, and of the circumstances connected with them, as far as their observations extended, there would, in time, be an accumulation of materials, from which we might obtain the following advantages:

"1. More correct knowledge of the diseases of the United States.

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"7 A comparative view of the health and longevity of the inhabitants in different places.

"3 Authentic evidences of all changes of the climate that took place; and particularly of the effects produced on the health of the inhabitants from clearing and cultivating the soil, and from the different modes and articles of culture.

"4 Persons labouring under any constitutional predisposition to particular diseases might select, with precision, a place of residence, least likely to call into action the particular predisposition under which they laboured. Such is the extent and variety of climates in the United States, that this might be done in almost every case, without changing the government or language to which persons proposing a change of residence were accustomed.

"5 Physicians would be enabled to direct invalids to such a route in travelling as would best suit their particular habits and diseases. From the want of this local knowledge, improper advice is frequently given. The longitude and latitude of places afford no certain rule. Their influence, controuled by a variety of local circumstances, is by no means uniform.

"The advantages of the proposed annual publications would not be confined to the medical department. The farmer and gardener, from an average of seasons, would be assisted in forming their opinion of the best time for their respective operations.

"The enterprising agriculturist, who wished to enrich his country with some new productions, would be informed when and where to make his experiments, by comparing the observations auxiliary to the practice of physic, with the usual habits of the particular commodity he wished to introduce.

"A facility might thus be given to the introduction of ginger, japan sago, of the almond, allspice, caper, clove, cinnamon, camphor, nutmeg, red cotton trees, and several other valuable exotics. There are, doubtless portions of the United States suitable to the culture of these articles; but that suitableness is unknown to foreigners, and equally so to the owners of the soil. The same observation applies to the introduction of new animals, and of new branches of manufacture. Success, in both cases, must be materially influenced by the degree of heat and cold, and of the moisture and dryness of the atmosphere.

"The foreigner, who wished to remove to this land of equal rights, would also be enabled to determine where to locate himself, in a situation least variant from his trans-atlantic residence."

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The following account of the diseases which chiefly prevailed in the course of the year is presented to our readers:

"Charleston, in the year 1802, was afflicted with four epidemics; the small-pox, the measles, the influenza, and the yellow fever. There were cases of the small-pox in almost every month of the year. It proved fatal to four children, though inoculated for it by skilful physicians; and also to about twenty other persons, who took it in the natural way. These died under circumstances horrid to see, and painful to relate. Covered with confluent sores, they could neither stand, sit, nor lie, without exquisite pain. Their bodies and bedclothes were stiffened with fœtid discharges from every part of their skin. The whole emitted a stench intolerable to bystanders. Humanity was put to the rack while it discharged the offices necessary for their support. In one case, an unfortunate negro (who caught the disease, remote from help, and unknown to his owner) was so far bereft of all power to help himself, that rats devoured a large portion of his *Tendo Achillis* some days before he died. The recoveries from the small-pox were much more numerous than the deaths. Though in many cases, the subjects of the former suffered comparatively little, there were others who escaped with difficulty, and after a painful and distressing confinement.

"A considerable number, (supposed to be no less than twenty) took the small-pox in the natural way, after having been inoculated for it, and after medical practitioners had declared that they had the disease. One of these unhappy patients died, and others suffered more from it, in consequence of no pains having been taken to obviate a malady, from the attacks of which they supposed themselves to be free, till its advanced stages evinced the mistake.

"The general complexion of the diseases, for the first seven months of the year, was inflammatory. Pleurisies, acute rheumatisms, and complaints of the breast, were uncommonly frequent. From these precursors, some predicted a sickly summer, and a great prevalence of yellow fever; but they were agreeably disappointed. July, and the first seventeen days of August, were cool and healthy; there was only one day in both months in which the mercury in Fahrenheit's thermometer reached eighty-nine. The old inhabitants were generally free from diseases of every kind; and only two strangers died of the yellow fever before September. Fourteen of the last days of August, and the twenty-two first of September, were steadily warm; but not to so great a degree as in some former years.

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In only three of them (the 26th of August, and the 14th and 15th of September) did the mercury rise as high as 89. On the other hand, in only two of them (the 5th and 6th of September) did it fall below 80. In this warm season the yellow fever began to extend, but was less mortal than usual. More than half who were attacked by it recovered. The mode of treatment, which seldomest failed, was depletion, followed by a mercurial salivation. There were a few, and only a few cases, where calomel produced its usual effects, in which the patient did not recover. Where the disease proved fatal, its superior excitement rendered this and every other medicine comparatively inert.

"A few strangers, though from northern latitudes, passed the summer (their first) in Charleston, without being attacked with the yellow fever. In three cases it proved fatal to persons who had resided in this city for eighteen months immediately preceding. No instance occurred of the death of any under twelve years of age from this disease.

"The eagerness of the people to receive their winter goods early in the season, induced men in trade to order matters so, that several vessels from foreign ports arrived in Charleston, with their unseasoned crews, in the months of August and September.

"To such the yellow fever was particularly inhospitable. To others arriving in the same season, Sullivan's Island afforded a safe retreat, till the danger was over. Exceptions to this have heretofore been very rare, and generally could be accounted for from some irregularity; but in the year 1802, five cases of the yellow fever (and two of them fatal), occurred in one house on that island, while the other inhabitants were generally healthy.

"No instance can be recollected, in which there was any ground to suppose that the yellow fever was either imported or had been contagious. No physician, nurse, nor other person exposed to contagion, from their intercourse with persons labouring under yellow fever, caught the disease. It was exclusively confined to strangers; and among them there was no evidence of its being communicated from one to another."

The introduction of the vaccine disease into Charleston is stated to have taken place in February, 1802, and to have succeeded in the most perfect manner. The author thinks that "nothing is now wanting to exterminate the small-pox but a general and simultaneous vaccination."

Among the medical improvements made in Charleston in the

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year 1802, Dr. R. mentions the establishment of a Dispensary, and the more active and energetic proceedings of the company incorporated in 1799, for the purpose of supplying the city with wholesome water from a pure and sufficiently distant source.

A regular series of meteorological observations is likewise included, which appears to have been made with great accuracy, and which affords a very satisfactory account of the temperature, &c. during that year.

The following interesting particulars of an attempt to rob the bank of South-Carolina, will, we are confident, appear to all our readers to be deserving of especial notice.

"On the night of the ninth of October, 1802, William Withers, a horse dealer from Kentucky, descended through a grate into one of the covered arch drains that pervade the streets of Charleston, and passed along the same, till he was opposite to the South-Carolina Bank. He then began operations to make a subterraneous passage across from the drain to the vaults in which the cash of the bank was deposited. In prosecuting this business, he passed ninety days and nights under ground, and in a prone posture. For the first twenty-two days after his descent, it was so uncommonly warm, as to be on an average nearly seventy-nine. For the last sixty-eight days the heat varied from seventy-four to thirty-three. In the first period, yellow fever, intermitting, and other fevers of warm seasons, were common among the inhabitants. In the last period, pleurisies, colds and catarrhal complaints, were, in like manner, frequent: yet, all this time Withers enjoyed good health, with exceptions of a few slight head-aches and pains in his bones, which generally went off with perspiration in the course of his next repose. His situation in the drain was distressing; but it was tolerable; after passing through it, he was surrounded with earth. He had no blanket, nor covering of any kind, but his light ordinary apparel, which he had never put off. His usual time of sleeping was when he judged it to be day, from the noise he heard over his head. His signal for recommencing work was the receipt of provisions, dropt by his accomplices, in the night, through a grate. He was sometimes exposed to serious danger from the springing of water; and his bed was earth, which was often damp. His food was mostly bread, butter, and cheese, and (with the exception of one bottle of wine) water was his only drink. Butter burning in a lamp afforded him light.

"Three days frequently passed without discharging the contents of his bowels.

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"The enjoyment of so much health, for so long a time, under such circumstances, was, in part, probably owing to the following causes:

"1 A strong constitution, inured to hardships in every period of his life.

"2 That constitution suited to the air of Charleston, by a very recent seasoning. He had but just recovered from a severe fever when he entered the drain. Though relapses are not uncommon, yet a new and distinct fever scarcely ever attacks strangers in the same summer, in which they receive their first serious impressions from our climate.

"3 The effects of moisture must have been, in a great degree, parried by his labour, and the moisture itself moderated by the dry sandy nature of the soil through which he had to work, and by the absence of rain: For the first fifty days after his descent, the whole quantity of rain that fell did not amount to two-tenths of an inch; and in the last forty was only five inches eight-tenths; besides, simple moisture, without heat or miasmata, is comparatively harmless.

"The absence of several of the exciting causes of diseases. The heat of well water and of the earth, a few feet below the surface, is generally the same in all countries as the medium heat on an average of the different seasons in these countries respectively. This, in Charleston, is sixty-five, or, at most, sixty-six on Fahrenheit's thermometer. Withers must have enjoyed a steady unvarying atmosphere of this temperature, while the inhabitants above ground were panting under a heat of eighty, or distressed with the cold of thirty-three, and subject to all the changes of an atmosphere, vibrating from one extreme to the other. That something in the air of Charleston, which is so destructive to strangers, in the summer and autumn, is too volatile to descend below the surface. Miners and colliers, in all countries, are generally healthy.

"The experiment is not recommended; but it is probable that a subterranean residence might be so constructed as to afford security against our local diseases.

"The great excitement of Withers' mind, from the prospect of accumulating wealth, must have counteracted the effects that otherwise would naturally have resulted from his situation. The energies of human nature, when in pursuit of a great object, (especially if invigorated with the hope of obtaining it) are beyond all calculation. The weakly wife, and the tender mother, will undergo watchings and fatigues in nursing the object of their affection, far beyond the power of hu-

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man nature to bear, when in a state of indifference. The high toned state of Withers' mind must have had a decided influence in preserving his health: It is much to be regretted that it was not excited by worthy objects."

We hope the author will be induced, by the considerations which he urges with so much force and good sense, annually hereafter to continue this Register; and that other physicians, in different parts of the United States, will become emulous to follow his good example.

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MEDICAL & PHILOSOPHICAL NEWS.

DOMESTIC.

PYRITES CONVERTIBLE TO MANURE.

Extract of a Letter from the Hon. ROBERT R. LIVINGSTON, *Esq. Minister Plenipotentiary from the United States near the French Republic, to Dr.* BENJAMIN DE WITT, *Secretary to the Agricultural Society of New-York, dated Paris, October* 10, 1802.

IN an excursion I lately made into Flanders, at some distance from the road, I observed several large beds of earth, that appeared to me to emit smoke and flame, which two men were tending. I stopped the post-chaise, and went to examine it. I found that it was pyrites sufficiently impregnated with sulphur to burn when dry. This was laid into beds, and fire set to it. They endeavoured to extinguish the fire when the ashes was *red*. If it burned longer it became *black*, and the quality of it was not so good. This earth, so burnt, was easily reduced to powder by a wooden mallet, and in this state was carried upon the backs of asses forty or fifty miles as a manure, and was used, particularly for grass, at the rate of about six bushels to the acre. The seed-grain was also covered with it as with gypsum in our country. This circumstance induces a belief that the *sulphuric acid is, both in this and in the gypsum, the fertilizing principle*, and may suggest many other ways of applying that cheap material to the purpose of agriculture. It is presumeable that in this very slow combustion the sulphuric acid is absorbed by the ashes, or rather earth, while the inflammable matter is dissipated, and that the union of the alkali and the acid forms a salt, not unlike, in its chemical relations, to gypsum; or, perhaps, one that is more soluble, more impregnated with the acid. Perhaps diluted vitriolic acid, directly applied, would be found equally useful, or rendered more valuable by being combined with wood ashes, when native gypsum could not be conveniently had.

If I rightly recollect, Du Hamel mentions that sulphuric acid, scattered over weeds with a view to destroy them, made them grow with additional vigour. And at Amsterdam I

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found a number of vessels waiting for the ashes of the turf, the principal fuel of that place, and which is supposed to contain sulphur. This is purchased at a high price, and is carried into Brabant and Flanders as a manure, and must come extremely high to the cultivator, because of the time that vessels are in waiting before they can receive a load, as it is sent them every day, as slowly collected from the inhabitants—a very judicious regulation prevailing here, which I could wish to see extended to all our large cities. It is found, with us, that the want of proper repositories for ashes frequently occasions dangerous accidents. In Amsterdam the city is divided into many rounds. A cart goes every morning to each house, and receives the ashes, which it carries to the vessels in waiting, and receives the price. A considerable revenue is derived from this object; and this tax is clear gain to the rich, whose servants would receive the ashes, as with us, as a perquisite, and burn a considerably greater quantity of fuel to increase it.

From the place where they were burning the earth I proceeded to the ore-bed, which I examined, and found the earth very similar to what I have seen on my own estate in Clermont, and which may, indeed, be found in many of our black meadows. I send you a sample of the earth as a guide to search for it at home. Many of our fellow-citizens will, I dare say, know where to find it. I also send a sample of the ashes. I would recommend to the Society to have some experiments made on this interesting subject; first, by searching for a similar earth, drying, and laying it in beds of about a foot thick, and burning it, occasionally stirring it with a rake; then pounding and sifting it in a lime-seive. If the earth should be too inflammable, perhaps a mixture of lime, which it would convert into gypsum, or wood-ashes, would be found useful. Secondly, by trying the effect of diluted vitriolic acid as a manure singly, or mixed with ashes. Thirdly, if it is clear that this acid is a fertilizer, to endeavour to find one that is still cheaper, and that might be found still better, as it had comprized already a constituent part of vegetables. The pyro-lignous acid may be obtained at almost no expense, by converting wood into charcoal in a pile, and condensing the vapour. The charcoal would defray the expense of the operation, particularly where wood was cheap. If the pyrites is in lumps, it must be reduced to a coarse gravel before burning.

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Speculations on Magnetism, by Dr. JOEL ABBOT, *of Washington (Georgia), in a Letter dated December* 24, 1802.

I have long been of opinion that the true knowledge of magnetism would afford to mankind the grand desideratum of longitude. My conclusions are from the two following considerations: 1st. That the seat of magnetic power is at the centre of the earth; 2dly. That it gives polarity and a *local meridional influence* to all bodies capable of receiving and retaining its impressions.

1. In proving the centre of the earth to be the seat of magnetic government, the first question is, Why does the magnetic needle point to the poles, if governed from the centre? According to Sir Isaac Newton, Dr. Halley, and others, there is a greater accumulation of matter about the equator than can be at the poles of the earth: hence the diameter of the earth at the poles is less than at the equator. M. Buffon says the semi-diameter of the earth at the equator is 1500 leagues, and at the poles 165th less; which makes the poles upwards of nine leagues nearer the centre than the equator. The needle then being placed horizontally, will point to the pole; it being the nearest direction on the surface to the centre.

A French gentleman, some years ago, in Philadelphia, ascended in an air-balloon, and took with him a magnet, which, at the height he went, would take up but a few more grains of iron than it had ounces at the surface of the earth. This shows that the relative difference of distance between the poles and equator, from the centre, is sufficient to give polarity to the needle, though governed from the centre. The dipping needle is only accounted for by a central magnetism; for it points below the chord of an arc from its place to the pole. The changing of the poles of a compass, on being carried across the equator from a north to a south latitude, or the contrary, is only accounted for in the same way. A bar of iron becomes magnetic the instant it is placed on the line of magnetic influence, that is, pointing with one end directly to the centre. Suspend a bar of iron vertically, and the instant it is suspended it becomes magnetic. Its lower end becomes a north pole, and the upper a south. Reverse it, and the end towards the centre will be the north pole.

Soft iron does not retain magnetism, but is very susceptible of it.—These are some of the considerations that have convinced me of a central magnetism.

2. Such bodies as are capable of receiving and retaining magnetic influence, obtain a polarity. This has been long

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known; but as this influence is on all directions from the centre, the load-stone not only receives a *polar*, but a *central* and *meridional* attraction to its own body.

It is as easy to conceive a meridional magnetic impression as a polar. While the load-stone is in its bed, it receives all its properties from a natural influence it is capable of retaining. This influence passes from the centre of the earth through all bodies; and when the load-stone is impressed with it, poles, meridians and a centre, are formed at once; all conforming to the poles, meridian and centre of the great magnet of the world. The load-stone is governed by the great magnet at the centre, and this is the reason why its poles are more conspicuous than its meridian; for the poles and meridian of a load-stone are governed by the poles and meridian of the great magnet. The poles of a load-stone are two points, and governed by the two points of its sire: the meridian is a surface, and governed accordingly. Hence the poles of the load-stone have been noticed, but not its meridian.

The place on the earth where the load-stone is impressed is its primary meridian, which meridian is as fixed as its poles, and will last as long.

From hence I conclude that a load-stone of equal texture, moulded in the form of a globe, will revolve once on its axis on being carried once round the world. The local influence it has obtained on the meridian where it was impressed, will direct that meridian on the ball to its native one, when carried to the east or west. When the magnetic ball (of the above description) is made, and floated on fluid mercury, its meridian is the true meridian of the place it is then in: its poles will conform to the poles of the world. Draw longitude lines from its poles, lines of latitude and the great circles, and I clearly believe it will give both the latitude and longitude to the place it is in. The north pole will sink in a north latitude, and the south will be elevated in the mercury, like the position of a rectified artificial globe, to any latitude. When it is on the tropic of Cancer, the tropic of Capricorn will be its zenith; and, if carried to the north pole of the world, its south pole will be its zenith. Its native meridional impression will be as permanent as its polar, and govern it, on an eastward or westward direction, upon the same principle that its poles point north and south. When it is carried ten degrees east, its meridian will be turned ten degrees west.

An artificial magnetism fixes the same principles in steel that are acquired by the load-stone. Therefore, a globe of steel-

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plate, well impressed, would prove to be the paragon of longitude. Two or four pieces of plated steel, of equal thickness, might be made into a globe. Two small drilled holes might be made, deep enough to admit of two pivots opposite to each other on the ball, by which it would be suspended, and serve for points to begin the impression from. If the globe, after being well polished, will rest at any point where the finger leaves it on the pivots, or on quicksilver, it is well formed. Then give it the magnetic impression from pole to pole, and if it rests in only *one position*, and easily recovers it on being moved, it is the true magnetic atlas.

I am fully aware that doubts are entertained of a meridional magnetic attraction; but were I not convinced of the truth of its existence, I should not write in such sanguine terms. The many circumstances and experiments which I have received as good evidences in point, could not be detailed in a letter sent by the mail.

B. Henry Latrobe's *Description of the Schuyler Copper-Mine in New-Jersey.* Written in 1796.

The Schuyler Copper-Mine, situated between the Rivers Passaick and Hackinsack, near their confluence, in the State of New-Jersey, was discovered, about the year 1719, by Arent Schuyler, grand-father to the gentleman of that name now living. The ore was found where it appeared on the side of the hill; was easily raised; and, as the policy of England, at that time, prohibited the establishment of smelting works or manufactories in her colonies, it was packed in casks, each containing about four hundred pounds, and exported, in its state of ore, to England.

It appears by his books, that, before the year 1731, Arent Schuyler had shipped 6933 casks, making about 1386 tons of raw ore, to the Bristol Copper and Brass Company. His son, Col. John Schuyler, prosecuted the work with more numerous and skilful hands. The quantity of ore raised by him is not known, as his books were lost during the war.

In 1761 the mine was leased to a company who procured the assistance of Mr. Hornblower, the uncle of the present eminent steam-engineer, from England. They erected a steam-engine of the imperfect construction then in use. The engine-house, composed of combustible materials, was soon afterwards burned down. It was, however, rebuilt, and the mine was worked for four years with great advantage and profit. In 1765 a workman who had been dismissed set fire to the

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engine-house. It was again destroyed, and the works were discontinued by the company.

Several gentlemen in England, however, whose connection with the company had taught them the superior quality of the ore of Schuyler's mine, applied successfully to the crown for permission to establish works in America for smelting and refining copper; and an offer was made to Mr. Schuyler to purchase the whole estate containing the mine, for the sum of £100,000 sterling. This offer he refused, but agreed to join them in rebuilding the engine and working the mine. The disputes which arose about that time between England and America, and the consequent revolutionary war, put an end to the projected works; and the deranged state of the country previous to the adoption of the Federal Constitution in 1788, and other subsequent circumstances, occasioned the total neglect of this in every respect important mine, until the year 1793, when a company was formed, who undertook the work with new vigour.

They collected, at a very considerable expense, miners and smelters from England and Germany; purchased a freehold estate convenient for the erection of furnaces and manufactories, with an excellent stream of water; re-erected the engine; and began, and partly completed the other works. At the instance of Mr. Longworthy, an active member of the company, who, to great metallurgic knowledge and experience, and to much personal address, joined a spirit perhaps much too unbounded in its projects, and far outstripping the means and wants of our present population, an application was made to congress, in 1796, for an exclusive right to search for and work all mines within the N. W. and S. W. territories, belonging to the United States, for thirty years. This monopoly was to descend from mines of gold and diamonds down to clay-pits and slate-quarries. The application was not, and, perhaps, ought not to have been successful. Soon afterwards one of the proprietors of the mine, who was a principal shareholder in the company, died, and the whole interest of the company has since been purchased by Nicholas I. Roosevelt. No other has yet been wrought to effect in North-America.

The ore of Schuyler's mine yields, in each hundred pounds of copper, from four to seven ounces of silver, and, like most copper ores, a small portion of gold. At the time when pure copper was sold in England at £75 sterling per ton, the ore of Schuyler's mine was shipped for England, at New-York, at £70 sterling per ton. This proves the uncommon richness

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of the ore, and the small expense of converting it into metal, An offer has been lately made by Messrs. Bolton and Watt to purchase all the ore which can be raised, and to enter into contract for that purpose.

Some Account of the Black-grass of Long-Island; in a Letter from JOHN SMITH, *Representative in Congress from the State of New-York, to* JOHN STRATTON, *of Accomac, Representative from Virginia, dated Washington, January* 3, 1803. *Communicated to Dr.* MITCHILL.

SIR,

In compliance with your request, I now attempt to give you some account of the grass known on Long-Island by the name of *black-grass.*

Black-grass has never, to my knowledge, been propagated, as other grasses commonly are, by sowing the seeds; yet I have no doubt that it may be produced in that way.

I have never been able to learn by what means it was introduced on Long-Island, nor how it was originally cast upon the shores of New-England, where it also grows. All with whom I have conversed on the subject seem to agree that it is a modern grass, or one lately introduced among us. I cannot find that it has been known more than sixty or seventy years on Long-Island.

During that time it has been gradually progressing from the westward. The seeds not having been conveyed by the hand of man, have evidently been carried *by the tides* from one place to another.

At this time, large quantities of hay are made from *black-grass,* on farms where ten or fifteen years ago it was unknown; and it is annually increasing and spreading over our marshes where the seeds happen to lodge.

Its native soil is neither upland nor low marsh; generally it grows and thrives best on land that is overflowed at least as often as once a year with salt-water, or is often wetted with brackish-water: to give perhaps a better description, *black-grass* grows on land too salt for clover and two fresh for salt-grass. And it is not uncommon to see a little white clover growing here and there among the black-grass, or very near it.

Black-grass affords excellent hay; it also makes early pasture, and as good as any grass whatever. When the soil is suitable, and the field is not pastured in the spring, you may expect nearly two tons of hay from an acre. It ought to be mowed about the same part of the season when you cut your

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clover for hay, and managed in the same manner and with as much attention, if you would have it good.

Never having known the seeds to be sown or distributed *by art* over the land, I am somewhat at a loss for proper directions to give for the disposal of the seeds, which I have gathered for your use. It seems to me, however, best to imitate the *method of nature*, and sprinkle them over the soil in autumn, or as early in the spring as the first of March. The fall of the year is the time when the high tides and strong winds happen, which bear away the seeds from the places whereon they grow, and cast them upon the margin of the bays and upon the marshes, adapted to their sustenance and multiplication. I am, nevertheless, of opinion, that the seeds may be successfully sown in the spring.

There is no need of plowing, harrowing, or otherwise preparing land for the reception of these seeds, as they are capable of taking root and increasing without. I would recommend, in order to ensure success to your experiment with the seeds which I send you, that you should scatter them in *many* places, instead of hazarding them all upon *one*. And by attending to the intervening space of your plantations, which lies between upland on the one hand, and salt-marsh on the other, you can scarcely fail to make a proper dissemination of them.

By attention to this plain and easy method of disposing of the seeds, I am in hope that not only your own farm and neighbourhood may be benefited by the introduction of black-grass; but that the whole Atlantic coast between the Delaware and Chesapeake Bays may, in the course of time, be improved thereby.

Accept my best respects, I. S.

HATCHETT'S ANALYSIS OF THE AMERICAN MINERAL SUBSTANCE CONTAINING A METAL HITHERTO UNKNOWN.

A very concise notice was taken of this discovery in our present volume, p. 212. Having since seen the memoir itself, as printed for the London Philosophical Transactions, we give a further account of this peculiar production. It was read November 26, 1801, and published in 1802.

In arranging some minerals in Sir Hans Sloane's Museum, now called the British Museum, Mr. Hatchett found a dark-coloured heavy substance, which, though a small specimen, attracted his attention, on account of its having some resemblance to the Siberian chromate of iron, on which he was then making some experiments. On turning to Sir Hans Sloane's

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catalogue, he found the specimen described only as "a very heavy black stone, with golden streaks." These streaks were only yellow mica.

It had been sent from Massachusetts, by Mr. Winthrop, to Sir Hans, with a parcel of iron ores. The name of the place whence they were taken is noted in the catalogue, though the characters are scarcely legible. As far as it can be made out, it reads "Nautneague." From the same place, it is probable, more of the like ore can be obtained. This is particularly desirable, as Mr. Hatchett has had so small a piece to work upon, and no other specimen, but the half which he reserved for the museum, is known to exist. We hope the gentlemen of Massachusetts, who respect Mr. Winthrop's memory, and are acquainted with the scope and direction of his researches, will find out the mine, and procure more samples of this singular mineral. We think this matter would not be unworthy of that excellent institution the Historical Society.

His experiments appear to him to show, that this kind of ore "consists of iron combined with an unknown substance, and that the latter constitutes three-fourths of the whole. This substance has proved to be of a metallic nature, by the coloured precipitates which it forms with prussiate of pot-ash, and with tincture of galls; by the effects which zinc produces when immersed in the acid solutions; and by the colour which it communicates to phosphate of ammonia, or rather to concrete phosphoric acid, when melted with it." The new metal retains oxygen with great obstinacy, and is therefore very difficult of reduction. It is acidifiable; for the oxyd reddens litmus-paper, expels carbonic acid, and forms combinations with the fixed alkalies. Still it differs, in many particulars, from the other acidifiable metals of arsenic, tungstein, molybdæna and chrome. And it is yet further removed from the newly-discovered metals of uranium, titanium, and tellurium.

No complete disoxydation of it has as yet been effected. The pure metal, therefore, has not been seen, even by Mr. Hatchett himself. And if this discerning experimenter had succeeded in freeing the metal from its oxygen, the quantity he worked upon was so very small, that it would have been impossible to have gratified many of the curious by presents. At this time it is not known what quantity may exist in nature, nor to what economical uses it may be applied.

While we express our hopes that the whole history of this Columbian mineral will soon be made known, we sincerely

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deplore the afflicting and untimely death of our friend and countryman, Mr. THOMAS P. SMITH,* from whose industry, acuteness and zeal in chemical (and, indeed, almost the whole circle of physical) researches, Mr. Hatchett informs the Royal Society he had anticipated important aid in this inquiry.

* We think it only a tribute due to justice, on this occasion, to insert the following account of a gentleman, whose memory we cherish with warm affection, and whose fate will be a subject of lasting regret to every friend of science in this country.

"*City of Washington, October* 8, 1802.

"Died on the 22d ultimo, at sea, THOMAS P. SMITH, in consequence of the bursting of a gun.

"Few men merit, and still fewer obtain, a long posthumous fame. Their virtues and talents are generally derived from local or temporary events, with the benefits of which they are forgotten. But the subject of these remarks lived not for himself, the particular spot that gave him birth, or the country of which he was proud to be a citizen. His heart exulted in the happiness, and sympathized in the miseries, of all mankind; while his mind exerted its great energies in their service.

"Before he reached the period of manhood, he abandoned the frivolous sports of youth, and applied himself to science. With but feeble advantages of education, at eighteen he was a respectable mathematician, and at twenty an eminent chemist. From this period, nature, in all her forms, attracted his attention, and he incessantly mingled the labours of the closet with an observation penetrating, practical and profound. Shaking off the dull logic and inglorious trammels of the schools, his mind disdained other materials of judgment than well-attested facts, analysed and applied by itself.

"Though fascinated to enthusiasm with the charms of natural science, he was not regardless of moral knowledge. He was an early, uniform, inflexible disciple of republican liberty; in his devotion to which he was as firm as the rocks which he so often trod.

"Two years ago he went to Europe, principally to extend his qualifications for mineralogical and chemical pursuits. But as the powers of his mind were not circumscribed by common limits, they embraced the whole circle of science. He travelled through England, Germany, France, Sweden, Denmark, and other countries. His associates, wherever he moved, were the learned and the liberal.

"With the fruits of a wide experience, he sailed, about two months since, for his native land. He had viewed the proudest countries of Europe; but he wrote to his friends that he had seen no country for which he would consent to abandon the United States, where freedom and industry confer happiness. He exulted in the prospect of soon meeting his friends, and in passing in their society, and in literary pursuits, the remainder of his days—

"But he has been disappointed. He is gone. With the youth of five-and-twenty has perished not the blossoms, but the mature fruit of age. Eulogium is often extravagant, but truth sometimes sustains her boldest panegyric: and when she declares that Thomas P. Smith, for science, had no superiors of his age in the United States, and promised, in the progress of life, to have few equals, she pronounces the sacred language of truth."

National Intelligencer.

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Violent Effects of Oxygenated Muriate of Mercury; communicated by Dr. JAMES S. STRINGHAM.

I lately had occasion to have recourse to Mr. Addington's manner of curing gonorrhœa, a particular account of which I met with in the sixth volume of the Medical and Chirurgical Review.—A married gentleman in this city had (during the absence of his wife) been attacked with symptoms of this disease. A few days afterwards he applied to me for a remedy which would remove it in the shortest time possible, as he was in daily expectation of his wife's return. He added, that should this take place before his complaint was entirely cured, his domestic comfort would be for ever destroyed. Placing some confidence in the assertions of Mr. Addington, I informed him that I did not despair of being able to accomplish his wishes in the course of a week; but that the remedies I should employ were such as I had never before used; and that, as they were violent, nothing but the peculiarity of his situation could induce me even to give them a trial. On his declaring himself perfectly willing to encounter every hazard, I immediately prepared for him three grains of corrosive sublimate, dissolved in one ounce of rectified spirit of wine. Of this solution he was to take one half at bed-time, and on the succeeding morning one ounce of Glauber's salts. On the next evening but one he was to repeat the remaining portion, with the salts as formerly. He punctually complied with these directions, and called upon me on the fifth day from the time he had taken the first dose, in no respect better than before. Considering him a proper subject for prosecuting the experiment, and wishing to satisfy myself as to the efficacy of the remedy, I ordered him, two days afterwards, to repeat the solution in the same way as before, taking the salts between each interval. On the night after having swallowed the second dose I was called upon to visit him. He had a profuse salivation, violent retching of the stomach, griping pains in the bowels, with great uneasiness in the head and throat, attended with delirium. He continued in this situation during the whole of the night; the same remedies were prescribed as though he had been poisoned by corrosive sublimate. On the next day the violence of his symptoms was considerably mitigated, and in about twenty-four hours afterwards they entirely disappeared. His gonorrhœa, however, continued precisely the same, and, in three weeks afterwards, was cured by the plan generally adopted.

From this single trial, I have no hesitation to conclude,

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that the method of curing gonorrhœa, as proposed by Mr. Addington, is both dangerous and uncertain. The same objections will not apply here that were urged against the surgeon who denied the efficacy of this mode of treatment. The directions of Mr. Addington were in this case literally pursued, so far as common humanity would permit; but without producing the smallest benefit to the patient.

I wish to make this case public through the medium of your useful work, with the hope that it may be the mean of preventing any other practitioner being placed in the same unpleasant dilemma from which I have been so lately extricated.

Curious Analogy between the Motion of the Blood in the Arteries, and of Water in Troughs and Conduits; in a Letter from MOSES YOUNGLOVE, *Esq. to Dr.* MITCHILL, *dated New-Lebanon Springs, January* 15, 1803.

The ingenious and profound Dr. E. Darwin, in his Zoonomia, vol i. § 12. 1 et seq. and elsewhere in his work, very rationally, and perhaps demonstratively, accounts for the systole and diastole of the heart and arteries, as well as for the alternation of muscular exertion and quiescence in other parts, by the mere principle of *animation:* but it is a curious fact, that, from some physical or chemical cause beyond my comprehension, something similar to pulsation occurs in the running of water in an aqueduct. I have observed it in several, but most frequently and particularly in the one which accommodates my kitchen, barn-yard and hog-pen. There is an uninterrupted descent of perhaps twelve degrees below the level of the horizon in the whole distance from the fountain to my house (66 rods), in which the rapid current is only broken by a watering-post, which, in a dry time, waters several fields bordering on it. As the water ascends in a bored channel on one side of the post, to the height of seven or eight feet, and descends in a like channel on its other side, I at first imagined it might be partly or wholly owing to this ascent that the flow of water in the duct is sometimes very small, slow and still, and then swift and full, with a roaring noise, and that in regular alternations of about five minutes; but I have since found that the same regular vicissitudes of flowing occur above as well as below the post.

The fountain does not afford a sufficient stream to fill the duct except in great rains; but when it runs fullest, and when it runs most scantily, the same regular succession in flowing continues.

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Suppose, then, that I could construct my aqueduct anew, of some substance as flexible and elastic as a human artery, bored smaller, to fit the ordinary stream from my fountain, would not these regular alternations of flowing in it occasion a dilatation and contraction of it somewhat similar to arterial pulsation?

The above phenomenon I do not remember ever to have heard or read of; and, trivial as it seems, it may, perhaps, form a link in some important chain of research. If you think it merits publication, it is offered to the service of yourself and the public.

Botanical Intelligence from Dr. BRICKELL, *of Savannah, in the State of Georgia; addressed to the Editors.*

As you have evinced a disposition to gratify botanical readers, I send a description of the *Stellandria*, a new, beautiful, and very singular genus, which grows in the woods near this town; having male and female flowers on different foot-stalks.

Male. Calyx, five unequal leaves; corolla, five equal petals; five antheræ, without filaments, sitting in a velvet receptacle.

Female. Calyx, corolla and receptacle as the male.—When the flower begins to fade, the receptacle swells, discovering numerous minute germs. This receptacle finally lengthens into a common pedunculus, forming a racemus of bilocular drupes. The nuts are solitary, reniform, emarginated on one side, monospermous.

Stellandria Glabra.

Shrub twining ten feet or more up bushes or small trees; leaves annual, alternate, very smooth, narrow at both ends, (some dented and cordate at base); corolla and receptacle crimson; fruit scarlet; antheræ like golden stars set in a crimson field.

We have a new species of *Samolus*, with the germ above the corolla. This I have named *Samolus Superus*. The *Kuhnia* grows here with distinct antheræ; leaves beautifully pinnate.

Wildenow has omitted the genus *Brasenia:* and for that reason I mention that it grows in our shallow waters. It has entire, elliptic, smooth, natant leaves, peltated exactly in the centre: the under part of the leaves, and all the other parts under the water, are covered with a very thick coat of most tenacious mucus, which may, perhaps, be applied to some

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useful purposes. This, and a new species of *Proserpinaca*, with finely pinnated leaves, were discovered by my friend Mr. Stephen Elliott.

POLICE OF SAVANNAH, &c. *From the same.*

Savannah is become more healthy than formerly, owing to the attention of our police, who being made sensible that putrid effluvium is capable of exciting malignant fever, have been careful to keep the town clean, and to have all putrescent materials carried out of the city every day.

Robust people, from northern climates, are liable to *coup de soleil*, from being much exposed to solar heat here. The blood rushes into the brain with such impetuosity, that a rupture of its finer vessels is apt to take place, unless relieved promptly.

Vomits in the beginning, or purges when they excite vomiting, augment the velocity of the blood, and the mischief, and sometimes produce gastritis and rupture of the finer vessels in the stomach; the effused blood mixing with the fluids of the stomach or intestines, giving the appearance of coffee-grounds in the discharges up and down.

The safest way is to attempt to lessen the momentum of the blood in the head, by opening the jugular or some neighbouring vein, and in violent cases even the vein in the arm, or some in the feet; and the bowels to be kept open. Water, in large draughts, is pernicious; but in small quantities, and frequently given, is a good febrifuge in these cases.

I was present at some experiments on the decomposition of the blood, performed by Sir Charles Blagden. Pure water, put in contact with the globule, caused the exterior pellicle to burst, on which the albumen ran out, as the albumen of a broken hen's egg, leaving the yolk, whose size is so small as to pass through the extreme vessels with facility: and as its diameter is about one-third of the globule, and globes are as the cubes of their diameters, it follows that twenty-six parts out of twenty-seven of the globule, viz. the albumen, may, when decomposed, pass off in perspiration, &c. while the remaining one-twenty-seventh part circulates without producing stimulus, by forcing through the anastomosis, as in ordinary circulation: and thus we obtain the benefit of diminishing the quantity and momentum of the blood, by a remedy the most grateful to the sick, and which, at the same time, diminishes the febrile heat.

Need I remark, that in Dr. Blagden's experiments the ap-

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plication of strong watery solutions of various neutral salts did not decompose the globule? I saw the experiments repeated several times on human blood, as well as on the blood of fowls, fishes, and other animals. I therefore reject all solutions of neutral salts as simple febrifuges in these cases; although some of them are good cathartics, such as the sal Rochelle, &c.

When I find the discharges up or down effervesce with alkali, I give a solution of fixed alkali in water with the happiest effects.

Particulars of a remarkable Body of Sea-Shells, now existing in the interior Part of the State of Georgia; from a Letter of Gen. DAVID MERIWETHER, *Representative in Congress from that Commonwealth, to Dr.* MITCHILL, *dated Washington, January* 11, 1803.

The shell-banks make their first appearance on the south bank of Savannah River, near the place called *White Bluff*, about one hundred miles, on a straight line, from the seashore, and run about south-west. They are not one entire ridge; but the ground is higher, for about six or eight miles in width, than it is above or below. On this ridge the shells make their appearance, in many places, near the surface, and in others deeper. Not only the *oyster*-shell is found, but *clam*-shells, and a *scolloped* shell nearly similar to the clam-shell. Some of them are large, and appear to be entire; others cemented together. I think I have seen some of them large enough to contain the foot of a common man. I have seen the shells in different parts of the ridge, for the space of *forty miles*. They are made use of for lime, but are not supposed to afford a product so good as the common shell-lime. I have been informed that, further to the south-west, and a little above the direct course, they get a congeries of shells, which is in a rocky form, and affords a better cement. And, what is more extraordinary, at some distance above that there are several quarries of a kind of silicious stone, which has a number of all kinds of shells intermingled and dispersed through it. These are petrified, and as hard as flint. This is made use of for mill-stones, which are thought to be but little inferior to the French burrs.

SCULPTURE OF THE AMERICAN ABORIGINES.

Mr. JEFFERSON, President of the United States, has in his possession several busts, which are thought to have been exe-

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cuted by the native Indians. They represent the human form almost down to the waist, and nearly as large as the life. The countenances are very expressive of the looks and character of the red-men. The wrinkled visage of an aged savage, with his peculiar cast of features, is strongly marked in one of them. These images were dug up at a place called Palmyra, on the Tennessee River. It is doubtful what kind of material they are made of. Some are inclined to think it is a solid stone, and that the figures have been worked out by the chizzel; while others believe it is a composition, and was moulded into its present forms when in a soft and yielding state. In either there is great cause for admiration, whether these pieces of imitation were fashioned by the hands of the sculptor or the potter: for as the substance is remarkably hard, the carving of it is scarcely less a matter of surprise to us than the baking of it. Whether they were intended as idols for worship, or mere likenesses of distinguished persons, is wholly unknown. And it is equally a secret to us, by what people among the predecessors of the present race of Indians such tolerable likenesses of the human head, face, neck and shoulders, could have been made.

Employment of Pot-Ash with animal Flesh, prepared and cooked for Food, instead of Muriate of Soda. (See Med. Rep. vol. v. p. 472.)

Many instructive facts are furnished by the history of rude nations. The Indian tribes of North-America furnish some very important particulars concerning the antiseptic and wholesome qualities of alkalies. Within the territory of the United States, many of the tribes, and more especially the parties on expeditions for war and hunting, are scantily supplied with common salt. Frequently their stock of that article is totally expended. The Delawares, Iroquois, Wyandots, Cherokees, Chickasaws, and Creeks, then season their meats with a form of pot-ash. As these people live chiefly upon animal flesh, it is a very natural inquiry by what means they preserve so perishable a material from corruption, and with what condiment they prepare it so as to render it agreeable to the palate and stomach. It is not correct, as stated by some writers, that because they preserve and eat their meat without sea-salt, that they employ no other kind of salt. The form of pot-ash the savages sprinkle on and mingle with the flesh of beasts intended to be eaten, is CLEAN WOOD-ASHES. When they mean to dry their meat for future use, they cut it into thin slices, and ex-

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pose it to a pretty hot fire; and, during the operation, they either baste it with a mixture of the gravy or liquor that drops from it *and ashes*, or they powder it, from time to time, with the cleanest *ashes they can collect.* Thus they alkalize their dried bear, deer and bison. They find that hickory and shrubby-oak (black-jack) yield the strongest and most alkaline ashes.

If they roast their meat, they are careful to dress it frequently, as it cooks, *with ashes taken fresh from the consumed wood.* This they dispose externally on every part. A portion of it dissolves, and penetrates deep among the fibres and membranes; while the rest, united with some of the animal juices, forms a sort of saline incrustation on the outside. This alkaline condiment renders the flesh remarkably more palatable; and, what is of greater importance, reconciles it to the stomach, and prevents the ill effects it would otherwise work upon the bowels. Very commonly the Indian collects fine white ashes from the fire-brands into the palm of his left hand, and dips the morsels of meat into them from his right. For the same reason, the Indians, when they broil flesh, choose to put it *upon the hot coals, and oftentimes they put another layer of live-coals upon the top of the slice. Thus they obtain a salting or seasoning with alkalies.* It is a common practice for an Indian to apply a bit of meat, just before he puts it into his mouth, to the surface of a brand, that it may attract the ashes adhering to it, as we dip into salt. These practices have been, and are now, commonly imitated by white men (hunters, soldiers, &c.) who remain long enough in the woods to expend their sea-salt and provisions cured therewith. The *alkali of the ashes* is then resorted to, and preserves their food and their health.

CHENEVIX'S BOOK ON CHEMICAL NOMENCLATURE.

A work of 246 pages 8vo. on Chemical Nomenclature, was published in London in 1802, by the distinguished Richard Chenevix, Esq. We mention it not on account of any great merit which we can discover it to possess, but because of the great freedom with which he treats the opinions of those who have preceded him in that nice part of logic which adapts words to ideas. The author is very free in his strictures upon Dickson, Pearson, Kirwan, Brugmatelli, and some others of the theologists. And his principal aim is, if we comprehend him, to vindicate generally the French nomenclature against most of the proposed innovations and attacks, except those made by

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himself; for he has a short chapter on such parts as were left defective by its authors. The cultivators of philosophical language will find a number of critical and shrewd remarks on subordinate points, but very little if any thing like radical and useful amendment. For example, he suffers at this time of day the illogical and delusive term *nitrous*, with its derivatives, to stand in the nomenclature, and signify the oxygenated forms of azote; and he inclines to the retention of that most preposterous and absurd of all words, *nitrogen* (p. 67), to denote the radical of *septic acid*. He proposes *thermogen*, to express the *repelling principle* or cause of heat (p. 65). *Photogen* is offered for *light* (p. 66). *Oxygenizement* for *combustion* (p. 159), &c. He declares roundly, if pot-ash and soda are compounds, then every thing in nature is compound, and not simple (p. 69). But, after these remarks our readers will, perhaps, be desirous of examining for themselves.

METHOD OF PRODUCING LATE PEACHES.

Practical men relate that the fruit of the peach-tree can be so managed as to ripen at a much later time of the season than is natural to it. Ordinarily, the kernel whence the young tree springs, is the product of the fruit which has been attached to the branch until *fully* ripe. But the kernel can vegetate, though severed from its parent stock in an *immature* state. It is found, that the plants afforded by these unripe, though germinating kernels, become more tardy in bringing their fruit to perfection. And by attending to this particular, *late* peaches may be procured at the option of the nursery-man. By raising a *new* race of trees from the *unripe* kernels of this *late* fruit, the time of maturing will be still further *protracted*. And by continuing this process, the peaches may be so gradually retarded as not to ripen at all. The warm season will pass away, and frost come on while the peaches, in an immature state, are hanging on the branches. The application of this remarkable quality of unripened kernels is very easy and extensive; enabling the gardeners to multiply their varieties of peaches, and to prolong this short-lived fruit to the extreme term of autumn. Would not the same method of planting unripe kernels render cherries, plumbs, &c. late as well as peaches?

ASTRONOMY.

The astronomical attainments of Mr. William Lambert, of Virginia, give him a respectable place among the cultivators of science in America. He has calculated and projected a beauti-

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ful plan of the great visible eclipse of the sun which is to happen on the 16th of June, 1806, for the city of Washington, in the Territory of Columbia. On this occasion the sun will be totally eclipsed at several places in the State of Ohio, and the Indiana Territory of the United States; in the northern counties of Pennsylvania; at the City of Hudson, and in other parts of New-York; at and near the northern boundaries of Connecticut and Rhode-Island; and at Stockbridge, Taunton, Dighton, and other southern parts of Massachusetts. Mr. Lambert has likewise calculated and projected a table of the total eclipse of the moon, which will happen on the 18th day of January, 1805, for the meridian of the city of Washington. This, as well as the former, is very handsomely executed. The same gentleman has done various other pieces of calculations in astronomy, which do credit to his talents, and, as we are informed, is engaged in other researches and calculations.

AN IDEA OF THE RATE AT WHICH DISTILLED SPIRITS ARE CONSUMED IN THE UNITED STATES.

As a medical, commercial, and political subject of inquiry, the consumption of ardent spirits is very interesting. Economists, statesmen and moralists have long deplored the abuses of these products of the still. But it is probable the cause of their regret and lamentation will not be soon removed. As long as one class of people find a profit in distilling ardent spirits from the raw materials; a second in purchasing them by wholesale, or shipping them from country to country; and a third in dealing them by retail to those who consume them; there will be distillers, merchants, and retail dealers in abundance, to satisfy the wants of him who wishes to regale himself with brandy, gin, whiskey, &c. When we consider the great amount of these articles brought to market, and reflect that they are all destined to pass into the human stomach, it becomes interesting to know minutely the rate and manner of their consumption. The following may serve as an example of what is frequently done by a labouring man in an American town, who passes for a sober citizen. As he walks out in the morning he takes what is called a *small* glass (half a gill) of bitters, gin, or something of the sort, at the first grog-shop he passes; and commonly takes a second whet (another half gill) before he gets to work. Generally he takes two more of these *small* glasses of raw and clear stuff (amounting to another gill) as he returns home to get his breakfast. Thus a half pint is disposed of before eight o'clock A. M.

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On going out from breakfast he takes a *large* glass, or a whole gill; and in the middle of the forenoon another. To this is added a third as he comes home to eat his dinner. This amounts to three gills between eight and twelve o'clock.

He drinks another *large* glass as he goes out to work, at or before two P. M. another in the middle of the afternoon; and a third on returning from work at six or after; making three gills more by the time his day's work is ended.

The daily quantity of distilled spirits consumed by one of these persons is as follows:

Before breakfast	2 gills.
Before dinner	3
By the time day's work is done	3
Total,	8 gills,

or one quart of distilled spirits, consumed by a single labouring man in a day, besides what he drinks in porter-houses, clubs and other meetings in the evening: and the greater part of them can still keep about, and do their work, without being actually drunk. By degrees, however, it overcomes them, and they yield to the repeated and excessive stimulus of their strong draughts.

The retail cost of these doses of spirits is a heavy tax upon the individual, and amounts to as much as would buy his family bread, butter and sweetening.

Morning drams, four half gills, at 3d.	1s.
Grog before noon, three gills, at 6d.	1 6d.
Grog after noon, do.	1 6
	4 shillings,

or half a dollar a day, spent out of his wages for rum, to be swallowed to his own ruin, and to the pinching and impoverishment of his family. There are hundreds of men who go on at this rate of drinking as long as health and money hold out. In the city of New-York there are houses where strong liquors are thus retailed. Alkohol seems to be a greater curse to Christians than opium to Turks.

Observations on the Barbary Coast; communicated to Dr. MITCHILL, *by Dr.* GEORGE DAVIS, *Surgeon to the American Fleet.*

I have been in Tangiers, but can offer few remarks on the place. The plague prevailed in this town, a few years since, with much mortality. If it proves epidemic in Tangiers, with

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all the advantages of its local situation, its commercial intercourse with the adjacent countries, as also its being the residence of all consuls, who ought to be supposed to have some influence with the police of the country, particularly as it relates to the general health; the other dominions of the Emperor of Morocco will always be harassed, in a greater or less degree, by this child of filth and nastiness.

The lower class, who are indeed three-fourths of the inhabitants, contrary to the injunctions of Mahomet, neglect, in a most beastly and filthy manner, their persons, as it respects cleanliness; a woollen waistcoat, with a haick, or a coarse woollen frock belted round, being their only dress, and which, I am told, is often worn without shifting until the ravages of time save them the trouble of removing it. The mode of building their houses, which are low, without any windows, and communicating one to the other from the roof, must have its influence.

The streets are narrow throughout all Barbary, and the receptacle of every species of filth and nastiness. The extreme poverty and indolence of the people, together with the miserable diet on which they subsist, must prove powerful agents in the production of this disease, which, once set in action, is greatly assisted by what they conceive the only means of arresting its progress.

YELLOW FEVER.

The difficulty of obtaining correct information from the more distant parts of the United States, has made it necessary to postpone till the present time our account of this disease, as it appeared in various places in the summer and autumn of 1802.

From the account of yellow fever at Charleston (S. C.), given by Dr. Ramsay, in his "Medical Register" for that city during the last year, it appears that it was confined to strangers exclusively; that few were affected with it before the month of September; that there was no ground to suppose it was either imported or contagious; that no physician, nurse, or other attendants on the sick, caught the disease; and that, among the strangers who were so susceptible of the disease, there was no evidence of its being communicated from one to another. The number and other circumstances of those who died of this disease in the course of the season, are thus stated by Dr. Ramsay:

"The whole number of deaths, in the four months already

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mentioned, from the yellow fever, was ninety-six. Of these, two took place in August, sixty-four in September, and thirty in October. In the whole number there was not a single native of Charleston, though five of them were born in South, and one in North-Carolina, twenty-one were born in England, twenty in the Northern States, nineteen in Ireland, eight in Germany, seven in Scotland, five in France, one in Spain, one in Prussia, and one in Madeira. The birth-place of the remaining seven could not be ascertained. There was not a single black, and only one mulatto, died of this fever. One of the subjects to whom it proved fatal had resided three years, partly in Charleston, and partly on Sullivan's Island. One had resided two years, two a year and a half, and eighteen for eleven or twelve months, in Charleston. The residence of the remainder varied from eight months to six days."

We are still unable to give a satisfactory account of this disease, as it prevailed at Baltimore. We have assurances, however, from a respectable physician of that city, that this epidemic shall be the subject of a special communication, which may be expected in some future number.

At Wilmington, in the State of Delaware, this disease seems to have prevailed more, and to have caused a greater number of deaths, in proportion to its population, than in any other town in the United States. In the department of Review we gave a pretty full account of Dr. Vaughan's pamphlet on this subject. The facts, which are so well stated and illustrated by him, leave no doubt, in every impartial mind, that the disease arose from domestic causes, and owed its propagation to the influence of the atmosphere, vitiated and replete with poison within certain local limits. According to him, the whole number of deaths amounted to eighty-six.

In Philadelphia the prevalence of this disease was partially experienced during several of the summer and autumnal months; scarcely, however, to such extent as to deserve the name of an epidemic. From the remembrance of former sufferings, great alarm and dispersion of the inhabitants ensued, and the course of business in the city was chiefly suspended for many weeks. The disease made its appearance early in July, and in the northern extremity of the city. The situation of the spot where it was first discovered is a low wharf, so depressed as to be overflown at every flood-tide, and most of the adjacent buildings are old and small. After continuing some time, the frequency of the disease abated so far as to give hopes of its entire extinction; but with an

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unfavourable change of weather it was reproduced, and spread to a much wider extent. A few days of hot weather, whether humid or dry, were uniformly observed to be productive of many new cases; while a change to a cooler temperature as certainly diminished the number. At the coming on of frost, as on all former occasions, a sudden disappearance of the disease took place.

It is supposed that about 250 persons died of this malignant disease. From the middle till near the close of October, a high degree of malignity was observed in a great majority of the cases which occurred. We are assured, on the best authority, that the most powerful remedies were never found to be more ineffectual, and that the proportion of mortality to that of disease was much greater than had ever been witnessed in the former periods of pestilence in that city.

As on former occasions, the origin of this disease at Philadelphia was a subject of warm controversy. The contagionists and importers generally agreed to ascribe the introduction of it to the *St. Domingo Packet*, a ship which had recently arrived from the West-Indies, and on board of which two persons had died on the passage. But this vessel lay twenty days at the Lazaretto, where she was thoroughly cleansed and purified, by washing, scrubbing, ventilating, fumigating and white-washing, and where all suspicious clothing and bedding were removed, before she was permitted to enter the port. No person who worked or staid on board of her, after her arrival, was taken sick.

So far as the effluvia of a vessel may be supposed to have been concerned in producing cases of this malignant disease, there is great reason to impute mischief to a brig called the *Esperanza*, which had lain in port upwards of nine months, and was found to emit a very offensive smell. A ship-carpenter who worked on board of her was the first victim to the disease; and many other cases soon afterwards appeared in the neighbourhood where she lay. She was ordered away from that part of the city where she had so long lain, and in the subsequent course of the season was permitted to be moored at a wharf in two other situations. Cases of malignant fever soon appeared at the wharves where she touched, though perfect health had previously existed in both these places. Thus was there an occurrence of yellow fever at three different points of the city in connection with the station of this vessel, which, by lying so long in port, and being so much neglected with respect to cleanliness and ventilation, had become a source of poison and death.

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By the information of a medical friend in Boston, we learn that in that town "the yellow fever was not noticed, nor did it become alarming, until the latter end of August: from this time it more or less prevailed through September into October, and with greater malignity than in any former year, equalling the worst species of genuine plague; yet the range of the disease was quite limited, and the number of cases and deaths comparatively small—perhaps not exceeding sixty. No strength of action or high excitement marked the early stage; on the contrary, it commenced in debility, which increased with the progress of the disease till it terminated in death—more commonly on the third day—seldom so late as the fifth: indeed the patient might be said to be dying from the moment of seizure. The venous congestion was very apparent from the bloody suffusion of the eye, from the cadaverous appearance of the countenance, and from the livid tinge of the whole surface of the body and limbs; the cuticular vessels, and those of the adipose membrane, being loaded with putrid blood. But the face was neither bloated, nor the body in any part swollen, notwithstanding there was this evident plethora of the smaller veins, owing to a condensation of the fluids, and a collapse of the arterial vessels, from deficiency of animal heat, and want of the natural stimulus, oxygenated blood. The escape of heat was gradual from the extremities towards the centre of circulation, till respiration ceased entirely, when no warmth could be perceived but round the heart. The lungs, indeed, early in the disease, seemed to have lost the power of oxygenating the blood, and thus was the sensorium deprived of that important ingredient which preserves the nervous energy, and supports the irritability of the muscular fibre. This circumstance alone accounts for almost all the appearances and symptoms of the disease; viz. the universal torpor of the vascular system, obliterated pulse, blood dark coloured and putrid, secretions deranged, sensations deadened or much impaired, &c. &c. I have been thus particular in stating some of the leading characteristics of the disease, thinking it may not be unimportant to notice their variations in different seasons. But were I to be still more particular, there would yet remain an indescribable something in the appearance of the patient, known only by having seen and attended him. In this year the disease commenced with the symptoms of the second stage of the disease, as it appeared in 1796 and 1798; though there was less derangement of the intellectual faculties, and the vomit rather

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resembled thin treacle in colour and consistency, and had none of the dark-coloured coagula which have been commonly compared to the settlings of coffee.

"How or whence the disease originated is not clearly ascertained, and probably never will be, though vulgar prejudice and a blind credulity find no difficulty in ascribing it to a foreign source. It was, as has been observed, very limited in its extent, being wholly confined to houses promiscuously situated at the heads of wharfs in the south part of the town; and it was remarkable, that if a patient under the disease was carried out of the range of the morbid atmosphere into a healthy part of the town, and attended by persons there resident, the disease was not communicated in a single instance; but not so if he remained on the spot where he took the disease: the attendants less rarely escaped. None of the physicians took the disease, for none resided within the infected atmosphere. The sickness of 1796 first appeared where it prevailed this season.

"*Treatment.*—Alas! the power of medicine, the skill and best efforts of the physicians, were equally unavailing. Whether the customary treatment was adhered to, or a new method adopted, it was alike to the patient: his death was inevitable.

"On this occasion the conduct of the Board of Health merited the highest praise. It was sprited, decisive and judicious. By their timely exertions many lives were saved, and much general calamity prevented. They had an exact knowledge of the number of the sick, and obtained the earliest information of every recent case of infection. They attended in person, and where it was practicable the patient was removed from the infected atmosphere into some suitable healthy situation, proper attendants provided, and every humane attention afforded. The vacated tenement was immediately cleansed by a liberal use of alkaline ley, the walls white-washed, and the filth and nastiness removed. In short, personal danger seemed wholly absorbed in a superior solicitude for the security of the general good and safety."

We learn also from a Medical gentleman at Portsmouth, that "the malignant fever made its appearance in that town the last of July, and spread terror and consternation through the town for about four weeks; during which time not more than a dozen persons were infected with it, most of whom died. The disease was more malignant than we have seen it heretofore, sooner tending to putrefaction.

"The origin of the fever cannot be unexceptionably traced to any particular source. There are those amongst us who

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advocate its importation; while others think it arose from our own filthiness.

"On the 12th of July a brig arrived from Jamaica that had lost most of her hands at that island with the fever; but at the time of her arrival she had no sickness on board. She passed Fort Constitution by a false answer, and came to the town. Before the fraud was discovered, and an order made out for her to perform quarantine, she was aground, and could not be removed till flood-tide. She performed quarantine, was scuttled and filled with water, and otherwise purified.

"Not half the persons who had the fever were ever on board or near her: neither was an hundredth part of those who were on board, and by the side of her, infected. Many people flocked to see her on the report of her being an infected vessel. The fever was mostly confined to that part of the town where the brig came to anchor.

"Previous to, and for some days after the arrival of the brig, the town was quite free of bilious complaints; but all at once they increased enormously; so that most complaints were of that type."

On a review of all the facts on this subject which have come to our knowledge, we consider the last summer and autumn as having been generally very favourable to the cities of the United States. The constitution of the atmosphere was such, in most places, as to give little disposition towards the origin and spreading of malignant diseases. Hence the ravages of the yellow fever were inconsiderable in several places where it undoubtedly appeared, and where the dispersion of the inhabitants was not great nor early enough to account for the small number of the victims.

The doctrine of importation and contagion has lost much ground by the impression of these facts. The important and radical distinction between febrile poison generated in a vessel from filth and putrefaction, and that which is derived from a foreign country, and communicated, by transfer of contagion, from person to person, is daily becoming better understood, and more generally adopted by the people. And when the generation, nature and operation of this febrile poison, thus produced on board of vessels, shall have been more completely developed and comprehended, we entertain no doubt that the community will universally embrace the opinion that the West-India Islands are unjustly accused of transmitting to us the contagion of fever; as vessels going from our ports may breed the mischief in precisely the same manner as vessels arriving here from St. Domingo, Jamaica, or other islands.

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BILL OF MORTALITY FOR PORTSMOUTH (N. H.) FOR 1802.
By LYMAN SPALDING, *M. B. &c.*

Complaint.	*Age.*	*No.*
Aptha.	4, 4 weeks.	2
Apoplexy.	66, 33, 55, 43, 63 years.	5
Atrophy.	55, 69, 40, 55 years. 3 m. 60 years.	6
Cancer.	55, 63, 60 years.	3
Canker-rash.	8, 2, 5, 7 months. 2, 16, 23, 4 y.	8
Cholera of Infants.	6 to 24 months.	13
Colic, Bilious	42 years.	1
Consumption.	14, 74, 53, 47, 53, 30, 69, 17, 33, 30, 60, 14, 33, 18, 69, 64, 60, 33, 28, 48, 52, 18, 29, 50, 63, 28, 22, 30.	28
Debauchery.	55, 38 years.	2
Dropsy.	69, 50, 84, 52, 89, 24 years.	6
Dropsy in the Brain.	3, 7, 7, 8, 13 years.	5
Dysentery.	3, 2, 2 years.	3
Epilepsy.	64, 2, 2 years.	3
Fever and Ague.	33 years.	1
Fever, Bilious	74, 30, 27 years.	3
Fever, Bilious Malig.	44, 31, 41, 13, 35, 21, 30, 40, 30, 13 y.	10
Fever Pulmonic.	65, 45 years.	2
Gout.	52 years.	1
Gravel.	41 years.	1
Hooping-Cough.	10 weeks to 1 year.	8
Infantile Complaints.	6 days. 4 weeks.	2
Measles.	7, 1, 20, 4, 9 m. 2, 7, 1, 2, 1, 2 years.	11
Mortification.	7 months. 1 year.	2
Old Age.	94, 90, 78, 76 years.	4
Palsy.	60, 74, 64, 50 years.	4
Phrenitis.	30, 12 years.	2
Premature Birth.		6
Quinsy.	3 years.	1
Scald Head.	1 year.	1
Small-Pox, natural	33 years.	1
Small-Pox, inoculated	1 year.	1
Casualties. Drowned.	48, 60 years.	2
Casualties. Fall.	55 years.	1
Casualties. Frozen.	82 years.	1
Casualties. Poison by Opium	4 months.	1
Casualties. Suicide.	32 years.	1
	Total.	152

Portsmouth, situated 43 deg. 5 min. N. 70 deg. 41 min. W. from London, contains about 5600 inhabitants. The town has been very unhealthful; some epidemic having raged the whole year. The hooping-cough, in January and February, was very prevalent; and some sporadic cases continued till September. The measles made its appearance about the middle of March, and was very prevalent till July; at which time a bilious malignant fever made its appearance, and continued till August, when the cholera and canker-rash commenced, and continued through the year.

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AMERICAN SLATE FOR COVERING HOUSES.

A quarry of *shistus tegularis*, or slate fit for roofs of building, has been opened in the town of Rhinebeck, in Dutchess county, State of New-York. Its quality is found to be excellent; and its quantity is greater than supplies the demand of the fast-growing city of New-York, where the law directs houses to be built fire-proof. A company is engaged in working it, and is able to supply foreign customers with the surplus of the slate employed at home. Until this discovery, all our slate was imported, chiefly from Great-Britain; but now there is not only a sufficiency for home manufacture, but for the supply of our neighbours and more distant dealers. In the course of a short time the slate will be delivered to them at the company's wharf at Rhinebeck, on the bank of the Hudson; and be easy of transportation by water wherever the purchaser pleases.

SOCIETIES.

Within the last twelve months Dr. Mitchill has been chosen corresponding member of the following societies, viz. Of the Agricultural Society of the Bahama Islands, whose meetings are held at Nassau, in New-Providence; 2. Of the Farmer's Society at Sandy-Spring, in Montgomery County, Maryland; 3. Of the Culpepper Society for promoting Agriculture and Manufactures, whose meetings are held at Stevensburg, in Virginia; and, 4. Of the Society of the Antiquaries of Scotland, whose assemblies are held at Edinburgh.

AMERICAN BOARD OF AGRICULTURE.

A number of respectable and patriotic citizens, including a considerable portion of the members of both houses of Congress, on the 22d of February, 1803, impressed with a clear conviction that numerous consequences highly promotive of the prosperity and happiness of the United States as a nation, and of its citizens individually, would result from a general diffusion of practical knowledge in agriculture and domestic manufactures, entered into an association for this purpose, under the name of the *American Board of Agriculture.*

For its more complete organization, the board adopted a *Constitution*, and elected the following *officers* to serve until the next meeting, which is to be near the commencement of the ensuing session of Congress, when a general election will take place.

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JAMES MADISON, Secretary of State, *President.*
SAMUEL L. MITCHILL, } *Vice-Presidents.*
GEORGE LOGAN, }
ISAAC BRIGGS, *Secretary.*
JOSEPH NOURSE, *Treasurer.*

Committee of Correspondence.

Abraham Baldwin, David Meriwether,	Georgia.
Thomas Sumpter, Benjamin Huger,	South-Carolina.
David Stone, Richard Sandford,	North-Carolina.
William Cocke, William Dickson,	Tennessee.
John Breckenridge, Thomas T. Davis,	Kentucky.
Wilson C. Nicholas, Philip R. Thompson, John Randolph,	Virginia.
Robert Wright, Joseph H. Nicholson,	Maryland.
William H. Wells, Cæsar A. Rodney,	Delaware.
Edward Tiffin, Thos. Worthington,	Ohio.
Samuel Maclay, Andrew Gregg,	Pennsylvania.
Jonathan Dayton, Ebenezer Elmer,	New-Jersey.
De Witt Clinton, John Smith,	New-York.
Stephen R. Bradley, Israel Smith,	Vermont.
James Hillhouse, John C. Smith,	Connecticut.
Theodore Foster, Joseph Stanton, jun.	Rhode-Island.
John Q. Adams, Joseph B. Varnum, Peleg Wadsworth, Samuel Deane,	Massachusetts.
Simeon Olcott, Samuel Hunt,	New-Hampshire.

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Meriwether Lewis, Territory of Columbia.
W. C. C. Claiborne, Mississippi Territory.
E. H. Harrison, Indiana Territory.

Any citizen who may have it in his power to communicate information on the subjects of agriculture and domestic manufactures, or on the auxiliary arts or sciences, is respectfully solicited to forward it to some member of the committee of correspondence.

NEW MEDICAL PUBLICATIONS.

It gives us pleasure to announce, that Dr. Mease, of Philadelphia, is now engaged in publishing an American edition of Dr. Willich's *Domestic Encyclopædia, or Dictionary of Facts and useful Knowledge.* This work is designed to exhibit a concise view of the latest discoveries, inventions and improvements which are applicable to rural and domestic economy: together with descriptions of the most interesting objects of nature and art; the history of men and animals in a state of health or disease; and practical hints respecting the arts and manufactures, both familiar and commercial. The several subjects are illustrated with numerous engravings and cuts. Dr. Mease will enrich the work with many additions, applicable to the present situation of the United States, and will comprise the whole in five large 8vo. volumes.

We have just received from Professor Waterhouse the *second part* of "A Prospect of exterminating the Small-Pox; being a Continuation of a Narrative of Facts concerning the Progress of the new Inoculation in America; together with Practical Observations on the Local Appearance, Symptoms, and Mode of treating the *Variola Vaccina*, or *Kine-Pock*." This important publication will be more particularly noticed in our next number.

Dr. Thomas Dancer, of Kingston, in the island of Jamaica, the respectable author of the "Medical Assistant, or Jamaica Practice of Physic," reviewed in our vol. v. p. 432, has lately transmitted to us a small pamphlet, written by himself, entitled "Strictures on Dr. Grant's Essay on Yellow Fever;" of which we intend hereafter to give some further account.

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FOREIGN.

ON PSORA.

OBSERVING, in your valuable Journal, Mr. Ring's observations on that cutaneous eruption termed Psora,* induced me to make a few remarks on the same subject, having experienced, in many instances, the ill effects of the external application of corrosive sublimate in this, as also *many other* cutaneous affections, by frequently inflaming and excoriating the cuticle where applied, rendering the remedy much more tedious and painful than the disease. Although I have seen good effects from the application of Mr. Ring's ointment in several trials, still it is liable to the same objection. Confident of this, and to obviate every inconvenience arising from irritation, was my sole motive for introducing the following formulas and plan of treatment, which I have invariably pursued with success beyond expectation.

No. 1. ℞. Calx Hydrar. Alb. ʒ ij. Ceruss. Acetat. Kali. pp. aa. gr. x. Ung. Simpl. ℥ ij. M. cum Essent. Bergam. et Lavend. aa. gtt. xx. ft. Linm. omni noct. utend. h. s.

No. 2. ℞. Calx Hydrar. Alb. ʒ j. Calomel pp. ℈ j. Lac Sulph. ʒ ij. Essent. Lavend. & Bergam. aa. gtt. xxv. Adip. Suillæ ℥ ij. M. applicetur omn. noct. h. s.

The preparation of sulphur, in this latter liniment, is devoid of that disagreeable smell which generally accompanies the other preparations of this kind, and seldom predominates: they are very neat applications; and it is rarely necessary to apply them more than two or three successive times, before a perfect cure is obtained.

In cutaneous and scurfy eruptions of the head, and extending behind the ears, frequently observed in infants, where a thin ichor sometimes pervades the cuticle, and almost excoriates when it is suffered to remain, I have found the following liniment, as a general application, of considerable utility, and seldom fail of effecting a radical cure.

℞. Creta pp. Calx Hydrar. Alb. aa. ℈ j. Ceruss. Acet. ℈ j. Ung. Hydr. Nitrat. ʒ ij. †Unguent. Pice ℥ ij. M.

* See Medical Repository, vol. vi. p. 102.

† If this liniment is found too hard, a little olive oil may be added; or, if tar ointment should be objected to, on account of its colour or smell, lard may be substituted.

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Although I am extremely averse to precise formulæ, yet cannot avoid recommending the above, the efficacy of which is surprising, when regularly applied: it absorbs and corrects the acrid virus, whether from a venereal taint, or any other acrimonious eruption, so frequently to be observed in children, particularly on the head. It should be applied every night, covering, at the same time, the parts with a bladder, or linen; and washed off in the morning with soap and water.

Alterative medicines are sometimes necessary to be administered at the same time; and of those, small doses, and such preparations as are not likely to pass by stool.

℞. Hydrar. cum Sulph. Magnes. Calc. aa. g. v. M. ft. Pulv.

Or a quarter or half a grain of calomel, given every, or every other night, may answer the purpose equally well, as the practitioner may think proper. The doses must be varied, according to the age, constitution, &c. of the patients; and, if acidity abounds in the first passages, should be combined with absorbents, such as creta or magnesia, as the bowels may be more or less affected. It will be necessary to observe, that the bowels must be kept gently open. N. G.

[*Med. and Phys. Journal.*

Observations on Antipsoric Preparations, in Reply to the above; communicated by Mr. JOHN RING, *Surgeon.*

When I communicated a remedy for a loathsome disease, which has stood the test of twenty-five years experience, and not failed in a single instance, I added a caution concerning its use, to prevent the only inconvenience with which it is attended. This caution, if observed, renders it as safe an application as any other of equal efficacy in the whole circle of medicine.

An anonymous Author of a Letter in the last Number of your Journal, has expressed a dislike to the formula, because he has seen unpleasant effects produced by the external application of hydrargyrus muriatus in cutaneous diseases. Who has not seen unpleasant effects from the use of every powerful medicine, whether employed externally or internally? If the abuse of a remedy is to be considered as an argument against its use, bark, opium, and mercury must be banished from the Materia Medica; and any man who gives antimonial powder in a fever, or antimonial wine as an emetic, ought to be condemned to the gallies; as he would have been two hundred and fifty years ago, had he dared to commit that crime at Rome.

Lotions, in which hydrargyrus muriatus is an ingredient,

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are very apt to inflame and excoriate any tender part; and it was this circumstance that first suggested to me the idea of using it in an unctuous form.

Your Correspondent strains at a gnat and swallows a camel. He objects to the external use of sublimate, because he has seen it, when incautiously applied, produce inflammation of the skin, and excoriation; yet recommends calomel to be exhibited internally; a medicine which, however valuable in some cases, is in cutaneous complaints unnecessary; a medicine which has sent many a victim to an untimely grave.

Your Correspondent has been more fortunate than I ever was, in commonly curing the itch by two or three applications of white precipitate. He has also been more fortunate in correcting the unpleasant and disgraceful smell of even that preparation of sulphur which he recommends. It is, however, only justice to the inexperienced practitioner, to put in a caveat against his placing too much confidence in the result of your correspondent's experience. Had not the mild preparation, so highly extolled by your Correspondent, frequently failed in my practice and that of others, even when persisted in for a much longer period, I should never have thought of employing what was likely to be attended with the least hazard, even to the most superficial part of the human frame.

Your polite attention to my former request, and your ready insertion of the memoir which I transmitted, claim the performance of the promise I then made.

The cure of gonorrhœa is rendered much more safe, pleasant and expeditious, by the use of injections; which are now universally employed by the most expert practitioners. Nevertheless, the best formula for that complaint in general, is, with regard to the majority of medical men, still a desideratum.

The following was communicated to me several years ago, by a gentleman not of the profession; who informed me, that having been peculiarly unfortunate, and often under the necessity of having recourse to remedies of this kind, he found it much more efficacious than any other which he had employed.

℞. Calomel. pul. gum. Arab. a. ʒ ij. Aquæ ℥ vijs. M.

It would be wrong to deny that this composition sometimes proves too stimulating; an objection to which every remedy is liable in proportion to its efficacy. No man, however, ought to practice physic or surgery who is not a judge of the cases in which the injection ought to be used in a milder form; and of the means necessary to subdue the symptoms, which arise from its improper use.

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Calomel, exhibited internally in this complaint, has been the death of thousands. I hope, in this enlightened age, we shall see that practice quite exploded. To this end, so devoutly to be wished, as well as to a general reform in the practice of physic, an Herculean labour, for which the united talents of all the members of the medical profession are required, no Publication has contributed more, or is likely to contribute more, than your own.

If any internal medicine is administered, perhaps no one is more proper than the following:

℞. Nitri purif. 3 j. Pul. Gum. Arab. Sacchari a. 3 ss. Hydrarg. Sulph. Rubri gr. vj. M. Divide in pul. vj. quorum capiat j. in aqua omni mane.

——Si quid novisti rectius istis,
Candidus imperti; si non, his utere mecum.

[*Ibid.*

NEW REMEDY FOR GOUT.

We present the following intelligence to our readers in the words of the publication from which it is taken. It is unnecessary to observe, that, if verified by longer and more extensive experience, it must be exceedingly interesting to obtain more ample details on the subject.

In the activity of research, and the great accessibility of men's minds to reason, which distinguish the present times, it is not to be expected that an affection (gout), bearing a great analogy to complaints which we have already learned to treat with success, should be passively submitted to, as of old. I am fortunate enough to have it in my power to offer a reasonable expectation of relief. Something less than a twelvemonth ago, an entire stranger offered me an anti-arthritic remedy of a character entirely new. He said it was prepared from a vegetable, which had not been introduced into any *materia medica*. It was described as having the property of dispelling the fits of gout with as much gentleness of operation as the bark exhibits against intermittents, and as having been in use several years with great benefit to the constitution, and almost total reduction of the disease upon the whole. I received a number of references to persons who had tried it with success. The discoverer also acquainted me with the name of the plant. He added from Dr. Bradley, the well-known editor of the Medical Journal, an attestation, purporting that the preparation would "speedily and *safely* remove the pain of gout."

On laying this statement before gouty invalids, I found

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some willing to hazard a trial. In no instance has the smallest untoward appearance shown itself, though some of my patients have been mere human ruins, threatening to fall at the moment of approach, and certain to be overturned by even a slight shock. The gouty symptoms have, in general, been removed with the greatest ease and rapidity. Many of those who have taken the remedy speak with a warmth of enthusiasm, which is unusual except after some great deliverance. The disease has been sometimes, at once, dislodged from the interior; and it seems as if, by stopping at a certain dose, worn-out invalids might have what is called a healthy fit. I have been struck with surprise at the signs of improved health at the end of six months after the *occasional* use of the medicine: for it has been seldom given, and seems only necessary at the time of the fit. In the mean time the experience of Dr. Bradley has been equally favourable. There lies before me a note, in which he declares himself to have used the anti-arthritic medicine in several cases of gout as well as obstinate rheumatism. "It gives," he adds, "great relief to the patients, and generally seems to produce a perfect cure:—he has never seen the slightest ill effect arise from its exhibition; and he has reason to believe, from a case or two, that it will prevent a fit of gout as well as cure one." If the medicine shall continue to justify its pretensions, the discoverer expresses himself ready to disclose his secret, on obtaining a compensation adequate to the benefit he shall thus confer on society. In a very few months, he informs me, it is his intention to bring the whole subject before the public. [*Beddoes' Hygëia*, vol. ii. p. 161.

Mr. BLAIR, *an eminent Surgeon in London, has lately issued proposals for publishing* "An Entire System of Medical and Operative Surgery;" *comprising the latest improvements in theory and practice; with numerous engravings of chirurgical diseases, operations and instruments.*

Mr. Blair offers the following Account of the motives and plan of this new work.

"It is not without extreme diffidence that Mr. Blair proposes to publish a complete system of doctrines and practical rules for the guidance of young surgeons: he is fully aware of the many obstacles attending the execution of this design. Such an undertaking has been long thought, by our most distinguished practitioners, to be an important desideratum: notwithstanding the commendable labours of Mr. Benjamin Bell, of Edinburgh, whose work is entitled to all the encouragement

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it has received. That publication appeared when no other British system of surgery existed: it was, therefore, highly probable it would meet with a favourable reception among Englishmen: but it is much to be regretted that the successive editions of that work have altogether omitted what continental surgeons deem valuable improvements in the healing art; nor has sufficient justice been done, either to our memorable predecessors, or to the actual state of surgery in London.

It has, for some time, been in the contemplation of certain practitioners in this metropolis, to supply these deficiencies; and a public intimation of their design was given about the beginning of last year; but, in the interim, a new and magnificent quarto volume has been published at Edinburgh (price four guineas), which is soon to be followed by another, entitled "*The Principles of Surgery*." One of the chief defects of surgical writings, however, has not been supplied by the author; for he passes too lightly over a very important, but much neglected, branch of the profession, *i. e.* MEDICAL SURGERY: not to mention that the expensive form of Mr. John Bell's splendid volumes is an insuperable bar to their general circulation. On all these grounds, Mr. Blair now announces his design of attempting (in conjunction with several of his friends) to accomplish a work which, he hopes, will tend to the advancement of surgical knowledge, and to the credit of its professors.

Although the difficulties which attend the completion of this project are considerable, Mr. Blair trusts he shall, in some measure, be able to surmount them, from the opportunities he has enjoyed, of superintending twelve or fourteen hundred surgical patients annually—from his immediate intercourse with the most celebrated surgeons of this extensive metropolis—from his correspondence with various intelligent persons on the continent—from the valuable collection of foreign books and engravings he has already received—from having long had access to the most admired records of antiquity—and from the friendly assistance he shall derive from his contemporaries, in different parts of the united kingdom. As to the systematic arrangement which is intended to be adopted, Mr. Blair proposes to begin with the most general and obvious principles; having first premised a few remarks on the education and duties of a surgeon. He is of opinion that the best practical arrangement of local diseases will be to treat of them according to the structure or situation of the parts affected, without regarding the scientific classifications of nosologists; for instance, on diseases

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of the arteries, veins, lymphatics, nerves, muscles, bones, integuments, &c. after which may be introduced the disorders of particuler organs and viscera, as the eye, the brain, the lungs, the genitals, &c. concluding the whole with those affections which depend more or less on a vitiated state of the fluids, viz. the yaws, leprosy, pellagra, elephantiasis, tinea, hydrophobia, cancer, scrofula, syphilis, cow-pox, &c. &c.

LONGEVITY.

Sir JOHN SINCLAIR, in his Essay on Longevity, wishes the following questions to have an extensive circulation, and invites all persons, as far as their experience and observation will admit, to answer them with minuteness and accuracy.

1. What is the effect of the climate in which you reside, on the health and longevity of the human race?

2. What form is reckoned most conducive to health and longevity?

3. Is it found, that being descended from young and from healthy parents is essential for good health and old age?

4. Is it found that health and old age depend much on the disposition or temper of the individual?

5. Is there any perceptible difference in consequence of situation of life?

6. What professions are reckoned favourable to longevity, or otherwise?

7. Is exercise and moderate labour found necesary for preserving health and long life?

8. Have the long-lived, in general, been in the marriage-state?

9. Have the greatest proportion of the long-lived consisted of males or females?

10. Have there been any instances of persons renewing their age, getting new teeth, new hair, &c.

11. What are the other circumstances tending to promote long life?

12. What is the effect of diet on health and longevity?

13. What are the effects of cloathing?

14. What the effect of habitation, and the difference of living in a town or in the country?

15. What are the effects of habits and customs in regard to early rising, bathing, regular meals, regular sleep; and, in particular, what are those minute circumstances on which it is supposed that health and longevity principally depend?

16. What are the rules regarding medicine which are accounted the most useful and salutary?

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17. What are the most remarkable instances of longevity, and how are they authenticated?

18. What are the rules adopted by those who have attained great age?

19. Have any tables of longevity been drawn up in your neighbourhood, and how do they agree with the one extracted from Hufeland?

20. Do any additional observations or particulars occur to you on the subject of health or longevity?

[*Med. and Phys. Journal.*

GALVANISM.

Citizen GUYTON, member of the National Institute, and Director of the Polytecnic School, read at the meeting of the Institute, held 7th Fructidor, a Memoir, entitled Researches on the Electric Pile of Volta, by Citizens Hachette and Desormes, Professors in the Polytecnic School.

This memoir contains two important facts, which tend to throw much light on the theory of electricity; the first is, that an isolated electric pile, or a friction machine of Nairn, positive and negative, and also isolated, that is, only communicating with the atmosphere, is an inexhaustible source of electricity. The second fact is, that many solid and dry substances, such as pure starch, or starch impregnated with different salts, may supply the moist substances of the pile of Volta, and allow of a mode of constructing piles, which, by the simple action of substances placed above, become the constant and inexhaustible sources of electricity. [*Ibid.*

PRIZE DISSERTATION.

The Institute of Health, of Gard, at their meeting at Nismes, have offered for the eleventh year, a gold medal of the value of 300 livres, for the best dissertation on the following question: "Are there any physical or chemical means of destroying the dangerous emanations which exhale from marshes, or from ground newly drained, and of preserving from its influence those who are exposed to them?" [*Ibid.*

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MEDICAL REPOSITORY.

VOL. VI.—No. IV.

ARTICLE I.

On the EPIDEMIC DISTEMPERS *of the Year* 1802. *By* NATHANIEL POTTER, *M. D. of Baltimore. Communicated to Dr.* MITCHILL, *in a Letter dated January* 28, 1803.

No. I.—MEASLES.

THE year 1802 constitutes a very interesting crisis in the history of American epidemics, more especially to those who view the Measles, Scarlatina, and Yellow Fever, as originating from one great general cause, and, consequently, as links of the same pestilential chain.

The winter 1801-2 was the dryest and warmest that can be remembered by the oldest inhabitants of our city. The mercury stood above the freezing point not only during the day, but through the night, much the greater part of the winter. The gutters, docks, and other repositories of *filth*, emitted an effluvium little less offensive than that which is exhaled during the summer and autumnal months. Whether the result of putrefaction contributed in any degree to modify the characters of our winter epidemics, I shall not pretend to decide; but state the most prominent symptoms and greatest variations, they occurred to my own observation, and leave the learned to deduce such conclusions as they may think reasonable.

Agreeably to the report of some of our practitioners, the measles commenced their reign about the first of January; but the symptoms were not completely developed in any case that occurred to my observation until the 15th of that month. During the months of November and December, I had remarked the unusual frequency of an indistinct efflorescence, which was occasionally associated with every assemblage of symptoms which might have been occasioned by the vicissitudes of the weather. It appeared to me to be the evanescent

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shade of the scarlatina retiring before the majesty of a more terrible enemy. It is true that the scarlatina had not been epidemic, but decided cases had occurred sporadically, not only in November and December, but during all the last year. This efflorescence was associated with inflammations of the parotid glands, and of the tonsils, with inflammation of the lungs and pleura, and with symptoms of catarrh, intermittent fever, and dysentery, and with a variety of anomalies that have no name in nosology, until it was suffocated with them all by the arbitrary interposition of the epidemic measles. No sooner had this disease discovered its proper features than every other fled before it; and what the poet says of fame may be justly applied to this as well as to other great epidemics: "*Mobilitate viget viresque acquirit eundo.*" So truly despotic were the causes producing measles, that even many of those who had suffered their influence in former epidemics were not entirely exempted. This miniature picture of the genuine disease appeared in several forms; viz. in catarrhal symptoms, in slight inflammations of the throat, in a sense of heaviness over the forehead, in a frequent watery discharge from the eyes, and, in a few cases, it was manifested by an eruption and a morbillous cough. These affections gave rise to an opinion that the system could be susceptible of measles more than once, and I shall say hereafter that this opinion was revived in spring, when the scarlatina arrogated the same dominion over the measles that the measles had done over the minor diseases of the winter. This second sensibility to the causes of measles seemed to be heightened by some inviting predisposition; but, above all, by previous diseases of the lungs. Adults were much more susceptible than children to this second impression; whence it would seem that the latter laboured under fewer predispositions, or that the former had partially lost the former morbillous impression. I did not see a person under ten years old affected with the slightest symptom, who had the disease when it was epidemic here six years ago. I saw no vestige of it in subjects above forty years old. Children were less violently affected by genuine measles than adults, but there were few grown persons who had not previously experienced them. This epidemic did not appear to me to merit the appellation of contagious in the same degree as small-pox, nor, indeed, in a very considerable degree. The causes seemed to me rather derived from the atmosphere than from a sick person; for many persons resided in families where the disease prevailed, and even slept with measly children with impunity.

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Should it be contended that measles are, strictly speaking, communicable from a sick to a well person, and should the opinion be well founded, is it not probable that some morbid or other strong impression had previously rendered such persons unsusceptible of impression from morbillous effluvia, just as the vaccine disqualifies the system for the reception of impression from variolous matter? There are, no doubt, many agents yet to be discovered, that may act as eternal preventives of the most deleterious poisons. Will he not be entitled to immortality who shall, by such a discovery, obviate the effects of the saliva of a mad dog, or of the plague-engendering poison?

The symptoms of measles are so well known that I shall only notice such as do not constantly occur, or such as require attention in a therapeutic point of view. As in other epidemics, so in this, there were many cases so mild as not to require the interference of a physician: indeed, it was so light in some children that none but the physician discovered it. The head was more violently affected with pain and tension over the forehead than is common in measles, although the swelling of the face was less considerable. The affection of the breast was the most important consideration, as the greatest danger was to be apprehended from effusions in the lungs: indeed, the organs of respiration, and parts adjacent, were affected in all the intermediate degrees between a slight cough and a most inflammatory fever. In some children the trachea and bronchial vessels were so highly excited as to occasion symptoms of croup. The affection of the stomach did not amount to that degree of puking which is so often mentioned by writers on measles; but a deadly sickness and a corroding sensation were constantly complained of. The affection of the stomach was less violent in adults than in children. The diarrhœa, so generally noticed in books, was seldom a symptom of this disease; never, that I know of, unless in consequence of neglected evacuations. The danger of the disease was in no wise in the ratio of the violence of the attack; for the cases that often proved most formidable manifested no turbulent symptoms until about the seventh day, when a sudden pulmonic affection often prostrated the system in a few hours. The ear-ach was often a symptom in children, as well during the inflammatory state as during convalescence. The eyes were sometimes highly inflamed, although ophthalmia was oftener a consequence than a symptom of the disease.

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The cure of the measles this year may be almost reduced to two simple remedies, *blood-letting* and *purging;* for when these were used in time, and carried to a sufficient extent, little or nothing remained to be done. These remedies were no less efficacious in removing the immediate symptoms than in preventing the consequences of the disease. This will be sufficiently apparent when we enumerate the deplorable train of consequences that followed their neglect. Such was the inflammatory grade of this disease, that a repetition of the use of the lancet was frequently required to the fourth or fifth time. As long as any symptom indicated the smallest relict of inflammation, the lancet was the most safe and efficacious remedy. The pulse required much attention, in some cases, to perceive the necessity of this remedy. Excessive inflammation or infarctions of the lungs, bronchia, or trachea, often obstructed the process of respiration in such a degree as to influence the pulse very materially. The skin was often cold, the cough laborious and unproductive, with all the symptoms of great indirect debility, with a pulse scarcely to be felt, and yet no remedy but venæsection could be depended on for relief; for the pulse rose after it, and free, distinct action, developed itself in all cases where the prostration had not continued a considerable time. This affection of the breast constituted the principal danger in this disease, but never produced death where the lancet was used early, and carried to a proper extent. Where the system had remained long in this semi-suffocated state, the lips and nails appeared blue, and a dark grumous blood was often expectorated. These were commonly the gloomy presages of approaching dissolution, unless the heart and arteries re-acted after bleeding, which was generally the case when it was practised before the ninth day, and sometimes at a more advanced state of the disease. In this disease, as in all others where indirect debility is induced by excess of arterial action, bleeding, to be useful, should be practised with great caution. Large bleedings can never be used with propriety where this state has long existed, and the longer it has existed the less should the quantity be.

The blood drawn from a vein was uncommonly florid when drawn while arterial action was vigorous and the pulse frequent, but lost its floridity as soon as the functions of the lungs became impaired, or indirect debility supervened. In the different degrees of prostration it manifested the following different appearances: 1. A copious deposition of a red precipitate to the bottom of the receiving vessel. This was

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deemed to be the first indication of a tendency to dissolution in the blood. 2. Blood of a darker complexion, separating imperfectly with the serum bloody, and the crassamentum like blood half coagulated. 3. A total dissolution of the whole mass, appearing like molasses or tar, without a separation, and very black. Some have imagined that this tendency to dissolution is occasioned by the miasmata acting as the cause of the measles; but such an hypothesis seems improbable, as it occurs in pleurisy, and in many diseases of excessive, long-continued inflammatory action; though it must be confessed that it occurs very often in such diseases as are called contagious. That the blood should be completely dissolved, and, in a few hours after, manifest a buffy coat, is almost an unanswerable argument against the solvent power of the miasma. This I have witnessed in measles, small-pox, pleurisy, yellow fever, and in other diseases. Does not this fact carry with it a strong presumption against the vitality of the blood? In the dissolved state it cannot be supposed to possess life, and it is equally difficult to suppose that it could recover its vitality in a few hours; nor is it probable that new blood could be so suddenly generated, when the chylopœtic functions are almost, if not altogether suspended. The blood was seldom sizy in this disease: the grade of the epidemic was so malignant that this appearance was seen only in mild cases.

Purging, though not as essential to the cure as blood-letting, was, nevertheless, a very useful remedy: calomel acted like a charm in removing the corroding nauseous sensation at the stomach. It was more grateful to that organ than any other purge, and required to be repeated every second day, or oftener, as there was a constant re-accumulation of that green acrid matter that was sometimes ejected from the stomach on the first attack; and this disposition commonly lasted four or five days. Where purging was neglected in the commencement, the evacuations from the intestines were often of a dark green, brown or black complexion, just as it happens in other malignant fevers.

Emetics were sometimes useful in removing excreted mucus from the bronchia and trachea, though they could not be used with propriety in the early or inflammatory state, because they increased the inflammatory action, and particularly the determination to the head. They often afforded a temporary relief of the nausea at the expense of increasing the fever. They proved more useful in the advanced state of measles,

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when indirect debility began to progress, provided no decided local affection forbade them.

Antimonials were certainly improper medicines in this disease: they depressed the pulse, and seemed to act too much like the causes of the disease. Are not antimonials equally unfit remedies in all malignant fevers, where the tendency to indirect debility is great, and more especially in those called contagious, where the *vis nocens* is so prone to induce the same state of the system?

Blisters were equally inapplicable in the first state of this disease, but co-operate powerfully with emetics in arresting the progress of indirect debility in the advanced state of measles, and sometimes called forth dormant excitement to great advantage.

Opium was equally inadmissible in all its forms, unless towards the latter state, when fever did not contra-indicate its prescription for the cough, which was often the last troublesome symptom, and seemingly occasioned by the action of a small portion of the pulmonary vessels.

Although measles generally run their course, in all cases, nearly in the same number of days, they manifested a trait discoverable in all malignant fevers; viz. a disposition to terminate in a shorter space immediately before they disappeared. This signal for the cessation of hostilities is very remarkable in scarlatina, yellow fever, dysentery, jail-fever, and others. The action of the morbillous fever produced one effect which I never saw from any other morbid action: it increased all the symptoms of gonorrhœa, and fomented that local action to a degree unknown to me. It was moreover evident, that, from the commencement of the measles to the termination of our autumnal epidemic, that disease not only resisted the common remedies, but yielded, in many cases, only to all the force of the whole train of antiphlogistic remedies. The difficulties attending the treatment of this disease, formed, during that period, a subject of astonishment and complaint for the practitioners of our city.

I should not have been thus particular in detailing the phenomena of measles, were it not that the popular opinion supposes them to be void of danger, and, therefore, seldom requiring the interference of a physician. A more hazardous notion cannot exist; for the neglect of no disease originates more deplorable consequences, even where the patient recovers. It therefore appears to me that this constitutes the most im-

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portant part of the subject. I shall enumerate some of the most common consequences of neglected or mal-treated measles; although the limits of a letter must abridge the list considerably.

1. Effusions in the lungs. 2. Effusions in the brain, constituting what are called cases of hydrocephalus internus: these soon produce death. 3. Debility of the lungs, inviting disease by constant predisposition. 4. Cough, often terminating in consumption, as well as the state immediately preceding. 5. Slow convalescence by the tedious process of expectoration. 6. Inflammations of the eyes were common: the palpebræ were highly inflamed both during the disease and long after its decline, and the cornea was often so completely covered with an excrescence as to obstruct vision partially or entirely: this was both a symptom and consequence of measles. This last symptom occurred principally among children, and began about the second or third day. 7. As ear-ach was often a symptom, so internal ulceration was a consequence of measles; and these frequently proved very difficult to cure. These occurred mostly in patients under puberty; and I met with several cases that resisted all the ordinary remedies, and yielded only to a salivation. Some were cured by injecting weak solutions of corrosive sublimate into the ulcerated ears. 8. Eruptions on the skin, comprehending several anomalies, but consisting more frequently of a thickening of the cuticle similar to the affection of the cornea, which may be justly viewed as the scarf-skin of the organ of vision.—These probably make no figure as to the whole of the evils resulting from neglected or ill treated measles; but they are sufficient to deter all reasonable men from trusting to the wild aberrations of nature in the cure of so dangerous a disease: and it is certainly a very consolatory reflection that none of them followed measles where *bleeding* and *purging* were judiciously used.

Before I relinquish this subject I must be permitted to describe one case of measles: to omit it would be to lose a pathological curiosity, the parallel to which (so far as I know) is not to be found in the annals of medicine.

On the 15th of February I visited Ann Watson, aged eleven years, who had been attacked with the usual symptoms of measles five days before. She had been an healthy child from her infancy; and the immediate cause of calling for medical assistance was an affection of the throat unusually violent for this disease. Excepting this symptom, nothing uncommon

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was discovered until the eighth day, when a coarse furfuraceous scale was discovered on each point where the eruption had originally appeared: from these this thickening of the cuticle diverged, and in three days it enveloped the whole surface of the body in one universal scale. This induration of the cuticle increased daily, and, by the fifteenth, it had acquired the hardness and thickness of the nails, and apparently in no respect different from them. This scale was not confined entirely to the external surface of the skin; it was perceptible (though in a smaller degree) on the insides of the ears, nose and mouth, and as far down the œsophagus as could be seen. Previous to the eruption, as soon as the cough began to agitate the lungs, an unusual degree of redness instantaneously diffused itself over the face; not like the hectic blush (so common in inflammatory affections of the lungs), confined to the cheeks, but extending over all the face. So violent was the influence of the lungs upon the skin, that this scarlet efflorescence, in some long paroxysms of coughing, extended over the whole body. The hair was materially interested in this symptom. The same substance was generated, in great abundance, from its roots, and seemed to be occasioned by a superfluous secretion of the substance forming the hair. Every hair acquired, at its root, the thickness of many hairs, and a whiteness, strongly resembling the *Plica Polonica*,* as described in books. Such was the thickness and hardness of this horny excrescence, that scales of it were frequently pared off without the least sensation. For some days before death, the least motion of the body produced extreme pain; and, when she walked, a sound was emitted from the body as if she had been cloathed in buckram. On the twelfth day she became considerably blind and deaf. The cornea thickened until it put on the appearance of having been burnt, and total loss of vision ensued. The deafness did not progress in the same ratio, as the hearing continued, in a small degree, as long as she lived. The sense of smelling was also considerably impaired. The sense of tasting was entirely lost. Sugar and salt, and even brandy and milk, had the like effect on the tongue and fauces. The understanding was not impaired, nor the least symptom of derangement discoverable through the whole disease. From the commencement of the induration of the cuticle, the symptoms became more and more aggra-

* Is this disease, so common in Poland, an increased secretion and deposition of the same nature?

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vated. The cough was frequent, hard and unproductive, but little pain was felt in any part of the thorax, and no expectoration appeared to the last. The greatest pain was experienced in exercising the muscles of deglutition, and the thought of attempting it frequently occasioned the most violent convulsions, in one of which she expired while attempting to drink, on the nineteenth day from the attack. Every idea, however remotely connected with the act of swallowing, occasioned the greatest trepidation of mind, and agitation of the whole nervous system: in short, these symptoms recalled to my mind all the horrible scenes of a most deplorable case of hydrophobia which I witnessed at eleven years of age. No pain of the head was complained of from the beginning. The most excruciating pains through the whole alimentary canal were felt, though not constantly. On my first visit she was bled, and a temporary relief from the cough was obtained. The blood was uncommonly sizy. Every attempt to evacuate the intestines completely proved abortive, although the attempt was made daily, for fifteen days, with the most powerful cathartics. The warm bath was resorted to in the violence of pain; but the relief produced by immersion, however long continued, was scarcely perceptible. Opium, for the four or five first days, produced a temporary relief, but at length it effected nothing more than the same quantity of water. With a view of relaxing the rigid cuticle, the body was covered with warm olive oil, with the longest respite from pain that she experienced; and large doses internally afforded considerable alleviation of the tormina of the intestines.—I regret that I was not permitted to examine, by dissection, the viscera and other internal parts, and must, therefore, leave the subject for the contemplation of the learned.

ARTICLE II.

FREDERICK HOFFMAN'S ESSAY *on the dissimilarity of* FIXED VEGETABLE ALKALINE SALTS; *with Observations and Remarks on the Changes which the Septic Acid undergoes by Combination with those Alkalies, by Dr.* MITCHILL.

IT has been repeatedly objected to me, that the *nitrous* acid of the shops does not correspond with the character which I find to be possessed by the *septic* acid. It is true that, in some of my early essays, published during the years 1795 and

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onward to 1798, I did employ the term "nitrous" as a sort of synonime to the word "septic:" but then I always enclosed it within a parenthesis, and my object was to lead the mind towards that acid as having a radical similitude with the one I was describing, though without any intention of affirming their identity. I now find that this has been misconstrued, and that some persons understand me as having affirmed that the nitrous and septic acids were so exactly alike, that what was true of one was in all respects true of the other.

Now, this is a serious mistake in me, if ever I said so, or in others, if they have ascribed to me what I did not say. In 1796 (see Med. Rep. vol. ii. p. 235—240) I stated this difference, as I thought, very plainly, and at considerable length. I repeated this sentiment, with some variation of statement, in 1797. (ibid. vol. i. p. 217.) To these I added a number of other considerations in 1799 (ibid. vol. iii. p. 14 & seq.), showing the dissimilitude of these two acid products. More was offered on this point in 1801 (ibid. vol. iv. p. 184-5), exhibiting still further the difference between the acid formed among corrupting materials, and the acid obtained by decomposition of salt-petre. In the same volume, p. 190 and 262, there are other views of this question, intended to put my meaning out of doubt.

That part of the history of putrefaction which I have attempted to explore, and to which I have called the attention of the learned world, *is the series of phenomena which occur from the moment of the formation of septic acid by any of the processes which produce it, to the fixation or neutralization of it by pot-ash.* My attention was directed to this period, because it had been overlooked by almost every observer, as it yet is by the greater part of scientific men; although it certainly embraces the most important portion of the facts connected with animal and vegetable disorganization. The history of the *nitrous acid had, I well knew from the beginning, been laboriously and profoundly explored.* With that I professed to have little to do, but employed myself chiefly in investigating the character and operation of *the acid of septon*, before it underwent the alteration which gives it the qualities possessed by the *nitrous*.

Still it is taken for granted by the philosophers of our day, that the acid obtained by decomposition and distillation of salt-petre is the very same, and identical thing which was formed in the midst of corruption, and among putrefying materials, by a chemical combination of septon and oxygen. This is

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as confidently asserted by them as if it was a matter of fact. Indeed, it is so absolutely credited and taken for granted, that the *natural history* of the acid, from the time of its formation to the time of its association with pot-ash (which is the most interesting by a great difference), has been almost wholly overlooked; while its *artificial history*, after its separation from pot-ash (by far less important), has attracted an uncommon share of attention.

But men of science did not always confound things at this rate. There was a time when opinions were stated as such, and not obtruded upon the world roundly and positively for realities.

Fourscore years ago the German chemists knew that salt-petre, formed from *distilled nitrous* acid and pot-ash, by synthesis, in a laboratory, differed from the neutral salt produced when septic acid combined with that alkali by the natural process, in heaps of dung and rubbish. LUDWIG had remarked that, notwithstanding all attempts to saturate them exactly, there would be some acrimony left in this *nitrum regeneratum*; to correct which a portion of quick-lime must be added.

The difference between natural salt-petre and regenerated salt-petre was so considerable, that the latter was by some affirmed to be unfit for making gun-powder. It was declared to have too little strength for that purpose. Others, however, were of a different sentiment, and declared *regenerated* nitre as good as the *natural*. (Junckeri Conspectus Chemiæ, tab. lxi.)

STAHL knew the destructibility of pot-ash: for when salt-petre was exposed to a torturing fire, for a long time, in an open vessel, it was wholly dissipated; both the acid and alkali disappearing. And he also knew, that if a mixture of salt-petre and charcoal was deflagrated in a tubulated retort, that both the acid and the alkali would be destroyed or decompounded; scarcely a vestige of pot-ash being found in the retort, or of nitrous acid in the receiver.

KUNKEL too had ascertained, by experiment, that putrefying blood afforded both septic acid and fixed alkali enough to form salt-petre. From one hundred pounds of corrupted blood, he obtained, by evaporation and crystallization, more than five pounds of genuine nitre. Juncker himself was perfectly aware of the convertibility of alkaline salt to nitre, by exposure to fœtid exhalations.

When an alkaline salt has been exposed too long to intense

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fire, the watery parts are expelled, and the salt itself degenerates to an earthy, fixed and insipid consistence.

The following curious fact is told of the convertibility of nitrous acid into pot-ash:—If the alkali, in its dryest state, is mixed with spirit of nitre, and turned to *nitrum regeneratum*, and afterwards, by aid of charcoal in close vessels, this factitious salt-petre is decomposed and turned back to *nitrum fixum*, or pot-ash, there will be found remaining a much larger quantity than was originally made use of. They both contain septon, and their constitution is probably more nearly allied in many particulars than is usually supposed.

It is the vulgar opinion that acids and alkalies are the opposites of nature, because of the effervescence they make on uniting, &c. but the Stahlians were of a different belief, thinking that their readiness to combine with each other indicated rather a similarity of constitution and a homogeneity of corpuscules. (Juncker. Consp. tab. vii.)

There is something uncommonly singular in the lime-stone caverns which furnish the salt-petre earths in Virginia, North-Carolina and Tennessee. These excavations are composed altogether of rocky strata of calcareous earth, or carbonate of lime. They extend for considerable distances towards the centre of the mountain in whose sides they exist. Neither rain nor sun-shine ever reaches them. In the bottom of them a salt-petre earth is found, which, after lixiviation, if carried back and replaced, becomes gradually impregnated with salt-petre again. There are no corrupting materials here to supply septic acid. There is no process of incineration to afford pot-ash. All that is discoverable is the crumbling and mouldering of the calcareous rocks which form the caverns. And in this rubbish or scrapings of the floors are found a large portion of *calcareous*, and a smaller quantity of *alkaline* nitre. To detach the portion of acid which is associated with the lime, the hunters and salt-petre-makers find it necessary to add a parcel of wood-ashes to the earth brought out of the caves. The alkali of the ashes attracting the acid from its calcareous basis, furnishes a greater quantity of salt-petre, and of a better quality, than can be procured by any other method. This *artificial* nitre, added to that previously formed by the *natural* process, makes up the amount which is procured. From a careful consideration of the facts afforded by the *natural* process of salt-petre-forming in these vast subterranean excavations, there appears no other way of accounting for the production of both a *portion of the native pot-ash and all the*

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nitrous acid, than by the decomposition of the calcareous rocks, and the formation of the two materials of salt-petre from the constituent parts of these strata of lime-stone; a part of which seems to change into pot-ash, and another part into nitrous acid!

A somewhat similar fact occurs with regard to the conversion of volatile alkali into nitrous acid. If corruption, instead of going on in open air, is made to take place in a closed apparatus, the ammoniac gradually disappears, and the mass changes to a sulphured-terrene, or, in some measure, *to a nitrous consistence*. This is analogous to the changing of nitrous acid to ammoniac during the solution of tin, and in other experiments.

BECCHER plainly affirms the mixture of septic matter with the water of the ocean. He supposes a quantity of nitrous matter derived to it from the various kingdoms of nature, whereby salt-petre is superadded to its common salt. This corresponds to NEWMAN's experiment of obtaining *aqua regia* from sea-salt, and of PRINGLE's experiments of some of it promoting corruption. (See Trans. of American Philosophical Society, vol. v. p. 140.)

But above all the pieces that I have met with in the older writers, HOFFMAN's *Essay on the dissimilar Nature and Properties of Fixed Alkaline Salts* contains the most pointed evidence of difference between pot-ash after it *has been* combined with septic acid, and pot-ash which has *never been* so combined. His observations are so remarkable that I deem them worthy of a full translation:—"It has been hitherto firmly believed, by experienced chemists, that the nature of the lixivial salts prepared by *calcination* and *incineration*, was not different, but the same, and that they possessed *equal* fitness for the purposes of medicine and the arts; and, indeed, this would seem to be the case, if we merely consider their mixture with acids of various strength, their effervescence, their saturation, and conversion into *salia salsa*, or neutral salts. But it will be more clearly and undeniably evident, from experiments I am about to relate, that the constitution, composition and qualities of these alkalies is *not the same*, and that a peculiar and specific difference prevails between them.

"1. *Nitrum fixum*, or pot-ash prepared from salt-petre, deflagrated with charcoal, undergoes strong ebullition on having oil of vitriol poured upon it, and exhales a disgusting smell like aqua fortis; but this does not happen if the experiment be made with salt of tartar or of wood-ashes.

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"2. If salt of tartar, or alkaline salt (as pot-ash is called by way of distinction), is melted in a crucible, and powdered charcoal be added to it in its melted state, to the amount of about half the quantity of the pot-ash, then the mass, on being poured out, is of a reddish colour, of a fœtid, sulphureous smell, not unlike the *hepar sulphuris* ordinarily prepared from salt of tartar and common brimstone: but if the *fixed nitre*, or that caustic salt which is prepared with regulus of antimony and salt-petre, is melted, and charcoal dust added to it in fusion, it does not undergo the smallest alteration of colour, smell or taste, but remains white and very pure.

"3. If with the salt of tartar, which is usually prepared by an extemporaneous process of burning together two parts of salt-petre and one of tartar, there be mixed a tolerably strong spirit of vitriol, instantly an odour like aqua fortis rises; but this never happens with pure salt of tartar, or any lixivial salt prepared from vegetables by incineration.

"4. There is a remarkable difference between the salt of tartar, prepared from crude tartar, *with* an admixture of salt-petre, and that obtained *without* it, as well as between the former and lixivial salt itself; in this respect particularly, that if you pour oil of vitriol gently and gradually upon the former, a stinking, disagreeable odour arises, and the surface becomes covered with a blackish pellicle, together with rising froth; and, indeed, the body of the liquor itself becomes blackish: but most certainly these appearances never happen to pot-ash.

"5. Clear glass can never be made from salt of tartar and sand; but glass of elegant transparency can be formed from the alkaline product of salt-petre and tartar (§ 3), and likewise from pot-ash.

"6. There exists no doubt among those who are addicted to chemical researches, that a highly caustic and alkaline salt may be prepared from two parts of salt-petre and one of regulus of antimony, melted together by a strong fire. This, freed from foreign particles by solution in water, and afterwards dried, acquires an *intensely red* colour by being mixed and digested with highly rectified spirit of wine. But if the like spirit of wine be poured upon the caustic alkaline salt prepared from two parts of salt-petre and one of tartar, dissolved and purified by water in the same manner, there is no tinge or colour of red to be seen.

"And although a tincture of extraordinary virtue, and of a *golden* colour, may be obtained by pouring highly rectified

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spirit of wine upon the salt of tartar prepared from *tartar alone;* yet the like never happens when the experiment is made with pot-ash, or with that salt of tartar which is formed from *salt-petre* and tartar.

"7. The waters of many of the medicated springs which are cold, and called *acidulous,* or are hot, and called *thermæ,* on undergoing a gentle evaporation, deposit a lixivial salt, which nearly resembles other salts: in this, however, there is a difference, that these lixivial salts of the springs, on being melted with powdered charcoal, are changed to *hepar sulphuris:* but this has not been observed to happen when the like experiment was made with the caustic alkali by regulus of antimony, nitrum fixum, or the alkali from salt-petre and tartar..

"These experiments amply and satisfactorily prove that *common salt of tartar is widely different* from the *alkaline salt which is an ingredient of salt-petre:* for the former, by affusion of oil of vitriol, salutes the nostrils with a fœtid smell, forms a less transparent glass, partly mingles with spirit of wine, and strikes a colour which the nitrum fixum, or the alkali from salt-petre and tartar never do; while, on the other hand, those alkalies which are ingredients of salt-petre, exhale, on being mingled with oil of vitriol, *the nasty odour of aqua fortis.*

"Hence it is correctly inferred, that salts, and other bodies of a very fixed nature, may conceal within them volatile, sulphureous and oily particles, by an attraction too strong for the *most intense fire to overcome;* while, at the same time, their connection is such, that, by virtue of the *attractions* consequent upon mixture with other bodies, these hidden materials may regain their distinct characters, and burst again upon the view."

As these facts were published as long ago as 1736, it might be presumed that the gentlemen who undertake to judge of scientific discussions were acquainted with them. But finding, of late, that even they who criticise and publish opinions to the world knew nothing about them, I determined to exhibit them in an English version. Why are all these instructive phenomena forgotten and overlooked? Wherefore are the truths disregarded or rejected which our predecessors laboured so hard to accumulate?

But to show the distinction in this case the stronger, the authority of BOERHAAVE might be cited. This great chemist affirmed (2 El. Chem. proc. 134), in the account he

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gives of Glauber's spirit of nitre, "that there was never any acid discovered, in any single experiment, like the acid procured by that process." And I am of the same opinion. This acid, and all its derivatives, are certainly *artificial* products, and exist no where but in the laboratories and in well-stopped vessels; while the original septic acid exists copiously among the ruins of organic matter all over the earth.

On the whole, I wish the gentlemen who attend to this subject to consider two things; first, that pot-ash, or the vegetable alkali, assumes an endless variety of forms, without being adulterated by foreign ingredients, and is not that simple, uncompounded element which some of them pretend to think it: the other is, that not a particle of *nitrous* acid ever existed in nature; in the laboratory of nature *septic* acid is formed, and oftentimes associated to pot-ash; and by that association, and by the process employed to extract it *by art*, THE SEPTIC ACID IS CHANGED TO THE NITROUS. And it is a most happy event for mankind that it is so; for thereby an alteration is wrought both in the constitution of the acid and of the alkali, very beneficial to living beings. Such being the facts, it clearly follows, that all the experiments made upon *nitrous acid and its derivatives* have no bearing or application to the *original septic acid as engendered or evolved in the putrefactive process.* The man must be very dull who affirms that *nitrous compounds* are the common agents of pestilential mischief; though he must be still more dull if he denies *oxygenated septon*, in its various forms, to be the noxious cause which alkaline salts and earths universally neutralize and subdue.

Through want of attention to these points of difference, it is probably to be understood wherefore my meaning has been so often perverted. Without intending to think or to reason wrong, the philosophical men have charged me with mistakes from which I hope I am free.

I request that they who have misunderstood me may peruse this piece, and reconsider what they have written and read. Particularly I request this of CHRISTOPHER ALBERT, who printed a Dissertation at Erlangen in 1798, *de Luis Bovillæ Origine et Naturâ;* and of NATHANIEL WEEKES, who defended an Essay *de Flava Febre*, at Edinburgh, in 1799. I would make a similar request of GEORGE LEE, of Philadelphia, if death had not removed him from us; though this amiable and candid man declared to me, in a letter written a little before he became disabled by his infirmities, *that he*

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would never contradict me again. I give the same invitation to HUMPHRY DAVY, of the Royal Institution, and to the Monthly Reviewers, of London; to Dr. J. C. SMYTH, to Mr. GUYTON, and to all the advocates for destroying contagion by fumigation with nitrous vapour and oxygenated muriatic gas, on both sides of the Atlantic; and to the writers of speculations upon infectious diseases, who have honoured either myself or my doctrine with their notice, in Philadelphia and Boston. As to the critical remarks made upon Dr. BAY's Dissertation on Dysentery, in Med. Rep. vol. i. p. 241, they were inserted at my suggestion and request, by the learned and polite gentleman who penned that review. When chemists shall have been taught, by further experiments, how ignorant they are of the true constitution of *nitrous acid;* and, from additional observations, how much they have yet to learn concerning the exact composition of the *vegetable fixed alkali,* they will lay aside a part of the positiveness with which they have conducted this discussion, and practise somewhat more of condescension and forbearance.

New-York, March 20, 1803.

ARTICLE III.

OBSERVATIONS *on the* SENSE *of* TOUCH; *showing that it may be employed to determine the Thickness of Natural Bodies, as well as their Heat, Cold, Shape, Smoothness, &c. By the Rev.* DAVID WILEY, *Principal of the Columbian Academy at Georgetown (Maryland.) Communicated to Dr.* MITCHELL, *March* 3, 1803.

OF all the external senses, that of the touch or feeling is supposed to be the most obtuse. But perhaps it is not so much so as is generally imagined. It has been less the subject of philosophical speculation than any other of the senses. Its organs are not confined to any particular part of the body, but, in a greater or less degree, appear to be diffused over its whole surface. In this respect it differs materially from seeing, hearing, smelling or tasting. It has also been supposed to differ from the former three, in requiring the immediate agency of its object on the organ to produce the sensation. Air is the medium of sound—light, of vision. By these media we may obtain some knowledge of the distance, position, magnitude, figure, motion, &c. of even very distant objects. We cannot feel or taste a distant object. This is without doubt.

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But it is not so certain that the object must be brought into absolute contact with the organ; at least their absolute contact does not alone appear to be sufficient to explain all the phenomena. But whether it be necessary to call in to its aid the principle of attraction or repulsion, or some other principle hitherto unknown, or already known, it is not designed at present to decide. A statement of facts is the most that is intended, and of facts chiefly relating to *feeling*. They may not be altogether new, or unobserved by others; but, as far as the writer can learn, they have, at least, been but little attended to. His attention they have in some measure occupied for several years. Little mention, however, has been made of them, unless to a few individuals, and then rather by way of inquiry than of communication. The facts are briefly the following:—That by *feeling*, the knowledge of something more than the mere surface of bodies may be attained. By barely *touching*, or rubbing the hand slightly over the surface of metallic plates, something of their thickness may be known. If one is thicker than another, it will be discovered. This fact has been ascertained by repeated experiments on copper, tin, iron, &c. To make the experiments fairly, the plates, when they are thin, must be bent into a globular, cylindrical, or arched form; otherwise their differing in thickness might be supposed to be discovered, from their yielding to the pressure of the hand in a greater or less degree. But so far is this from being the case, that it is only necessary to touch the plates in the slightest manner. The plates ought also to be of the same kind of metal. They may be of equal polish, and of the same shape: nor will their temperature affect the experiment. They may be either hot or cold. The experiments were made chiefly on copper stills, kettles and boilers, and sheet-iron and tin bent in form of an arch. A very small difference in thickness is found to be discoverable by merely passing the hand gently over either the convex or concave surface. Some experiments have also been made on glass, stone and wood. The result was much the same, unless that it appeared to require a greater difference in thickness to cause a manifest difference in *feeling*; and that still more in wood than in glass or stone. Nor is it conceived that it requires any peculiar delicacy or acuteness in *feeling*, to be capable of making and perceiving the truth of such experiments. As in our other senses, so in this, the more perfect and acute the organ, the more accurate the decision: but it is supposed that every one possessed of feeling at all may make the experiment

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in some degree, and that the capacity to make the decision belongs to the nature of the organ. To what degree of accuracy such experiments may be carried, it is not pretended to say. The principal fact alleged is, that *feeling* has not merely the surface of bodies for its object. Something may be known of their thickness. To establish this, it is not necessary to be capable of discerning by *feeling* that one plate is a quarter of an inch thick, and another but half a quarter. It is sufficient to be able to distinguish the one from the other, and pronounce which is the thicker; and this can be done with the greatest certainty. Such are some of the facts. What is to be inferred from them? They cannot result merely from contact. Our organs of *feeling* will not come into contact with more matter on a thick plate than on a thin one. The phenomenon must be accounted for, if at all, on some other principles. On what? Let those who have leisure and opportunity endeavour to determine. In addition to such experiments as have been already mentioned, let attempts be made to ascertain the difference of feeling between substances of different specific gravities, and of the same thickness; as, for instance, between gold and silver, gold and copper, silver and copper, silver and lead; between different kinds of stone, as marble, slate, limestone; between different species of wood, both when green and when seasoned; and between different kinds of glass; and also between plates of different kinds of metal, stone or wood, of thicknesses inversely proportional to their specific gravities. The plates may be polished, gilded, plated or varnished, to render their surface as nearly of the same texture as possible. Experiments might also be made on thin cakes of tallow, rosin, wax, and on crockery ware. It might even be worthy of examination, whether something respecting the health, vigour and soundness of animal bodies might not be discovered by *feeling*.

To some, perhaps, the subject may, at first view, appear to be trifling, and little worthy of notice. But let it be considered that it forms a part of the philosophy of human nature; that it must materially affect the theory of sensation, especially that of *feeling*, which, in some respects, may be accounted a genus, comprehending all the other external senses; that it may afford additional evidence for the existence of certain properties of matter, or bring to light some hitherto unknown property; that it may be applied to a useful purpose, in the common concerns of life, by affording an easy mean of judging of the thickness and soundness of any vessels of metal, stone and glass.

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ARTICLE IV.

MISCELLANEOUS REMARKS *on the* SMALL-POX *and* KINE-POCK: *Communicated to Dr.* MITCHILL *by Dr.* MOSES YOUNGLOVE, *in a Letter dated New-Lebanon Springs, February* 12, 1803.

SIR,

CONSIDERING the hopeful progress of vaccination, any communication and discussion relative to the *small-pox* may, to some, seem unseasonable; yet, notwithstanding the flattering prospect that the former will generally supersede the latter, as to the practice of inoculation, in all lettered States, at a time not very far distant, the prevalence of the latter, for reasons well known, is still considerable; and since, through its very infectious nature, and the great intercourse by commerce, this may, for a time, remain the case; and since investigations on any disease are more or less favourable to the study of every kindred disease, I take the freedom of offering to your inspection a few desultory remarks, with reference to what hath appeared in several publications relative to the small-pox.

A question is controverted by pathologists, whether two or more contagious diseases can operate at once on the same subject. It appears, by the last number of the Medical Repository, that Dr. J. R. Coxe, in his late treatise on vaccination, which I regret that I have not seen, advocates the affirmative of this question; while Mr. J. Hunter, Dr. E. Darwin, and several others, maintain the contrary; and some of them make of that opinion a theoremic basis to very important deductions. From long and diligent observation, I am fully confirmed in Dr. Coxe's opinion in the premises. Many instances have occurred of my patients having, at the same time, the small-pox and measles, the small-pox and chicken-pox, the small-pox and the venereal disease, the small-pox and the mumps, and the small-pox and whooping-cough; and, as far as I could see, both diseases, in each case, proceeded in their usual progress, without any suspension of the operation of the one by the other, as several writers have supposed. Nor did the two diseases, that I know of, coalesce, and form a third intermediate *something of a disease*, as Dr. Darwin ludicrously supposes (Zoon. § 33. 2, 9), though they, in several cases, appeared to be in even progress; and in one in-

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stance, about the year 1785, I had a patient, when the measles were prevalent, who, about the thirteenth day after inoculation, and after pretty severe symptoms, broke out with the small-pox and measles both at once; but the latter appeared entirely apart, in blotches of an inch or two diameter; after which both happily proceeded in their natural operation.

As to the opinion espoused by Dr. Coxe, and other reputable authors, that some persons have had the small-pox more than once, as I have no proof to the contrary, so neither have I, in my practice, seen any evidence in favour of it. I once, through mistake, inoculated a family with infection of the chicken-pox instead of the small-pox, when the operation produced, though slight, yet did not undeceive me (I being then young in the practice), till the person out of whom I had taken the infection happened, under my eye, about a year after, to break out with the natural small-pox, which admonished me to inoculate them anew with the true infection; but had it not been for this seasonable discovery, these patients might, many years after, have had the small-pox by the natural way, and I might have confidently asserted that they had the disease a second time.

I have also known several instances in which practitioners of little experience have inoculated for the small-pox with matter adulterated with the itch, or the like, which producing a sore, and a kind of eruption, were pronounced safely through the intended disease, yet have afterwards caught it, and then been said, as confidently, to have it a second time.

It is also asserted, by some writers, that there are, in every country, some to whom the small-pox cannot be given by inoculation, although they have never had it before trial; but in the course of my experience during the revolutionary war of these States, and since, on, I believe, not less than thirteen or fourteen thousand subjects, I have found none such when my infection was good: though I know several persons who, having had the disease very slightly, are generally thought to be of that description.

Nor have I ever, but once, seen the operation of the spurious or imperfect small-pox mentioned by Dr. Coxe sometimes to occur, which was about thirteen years since, when I began inoculation, between Kinderhook and Claverack, with old infection, procured from a neighbouring physician: but very singular was its operation: its taking effect was generally uncertain without repeated inoculations; its whole subsequent operation was

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mostly so slight, and often partial too, producing only a scabby eruption on the inoculated arm, that my utmost efforts could not, in every instance, produce an operation fully satisfactory, though a very few had the disease severely, with a natural appearance enough. This continuing the case for several weeks, while I could procure no other infection, but inoculated every succeeding class and family with the best I could select from the preceding, I was constrained, merely on that account, to desist, though reluctantly, after having inoculated nearly two hundred.

There is a query (Med. Rep. vol. i. p. 103) whether, in inoculation with the small-pox, the insertion of an unnecessary quantity of the matter will increase the virulence of the disease? To this I answer, that though I have never plainly perceived any injury from this source on strong subjects, yet on tender infants, and weak patients in general, I have thought the insertion of much, especially by deep incision, and more especially if repeated in several places, to be very injurious, apparently through the unnecessary corrosion of the skin, cellular membrane, and even muscular flesh, and the consequent fever, depression, and the early and unnatural absorption of the matter into the mouths of the lymphatics.

As to the advantage there mentioned from a dilution of the virus before ingrafting, I am fully of opinion that it does in no case tend to the proposed mitigation of the disease, but that it is highly improper, rendering the communication of the disease far less certain, if a mixture of water, or any other extraneous matter, be unnecessarily admitted. And hence the reason is evident why the first limpid matter in the pustules is so very sure to communicate the disease by inoculation; this young matter being naturally the most pure from any mixture of common pus, or other foreign material.

Dr. Darwin queries (Zoon. § 33. 3, 1), whether the infection of the small-pox can be effectually cut out again after inoculation. I can partly answer this, by stating that, about fifteen years since, on the alarming illness of one of my patients (at Lunenburg, near the city of Hudson), with the appearance of an incipient yellow fever, on the third day after an inoculation which had undoubtedly taken effect, I freed him from it by cutting out a piece of skin less than a dime; but that I have since failed in a similar attempt, the fourth day after inoculation, in a manner, however, indicating, that if my incision had been made wider and deeper it might have

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succeeded: for about the ninth day after inoculation, as in other cases, the sore was surrounded with the true pock inflammation, and the eruptive progress following was as usual.

Dr. Darwin (Zoon. § 33. 2, 10) acknowledges his recent conviction, that the variolous matter never circulates in the blood of any person infected with it, as evinced by several experiments of inoculating with the blood without effect. Yet, notwithstanding this rational conviction of him and others, the position is controverted, and, as far as I am acquainted, generally discredited. As for myself, I was more than twenty years ago convinced of its truth, and have since been more and more confirmed in this conviction, by having observed the following among other evidences of it.

1. Generally about five or six days from the inoculation all its observable operation is confined to the infected spot, or very near it; for a few days longer its progress from that is mostly slow and gradual; and then it first affects the glands and muscles on the same side, about the shoulder, neck and head.

2. The following progress of the eruptive symptoms is very similar to that of various other potent irritations.

3. I have inoculated, I believe, much more than a hundred women, in the early and middle stages of pregnancy, with safety in most cases; and have frequently, long afterward, inoculated the children so born of them, who have invariably undergone the usual operation of the disease, which might not have been the case had the variolous matter pervaded them in utero.

Nor hath the argument any weight with me, when some former writers urge the infectious nature of the pustules emanating from the blood, as a proof of the presence of variolous matter in that fluid; for I have diligently sought, in vain, for any evidence of infection in the incipient pustules before maturation; and they never maturate but where they are exposed to the air; a portion of which may, perhaps, for that end, form a chemical union with some of the secretions of the patient, essential to their contagious maturity; and hence, in abortions from this disease, in the last stage of gestation, the pimples frequently observable on the fœtus have none of the variolous matter in them.

4. I have never known any person take the small-pox from the blood, though exposed to it, fresh drawn, at the most likely season, after the absorption into the lymphatics of a profuse and crystalline eruption, which is sometimes astonishing, both as to the quantity of matter receding from sight,

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and the quickness of its recession; insomuch, that I have once seen an instance where the bladdery cap of a large, full, remaining crystalline pock, was hastily pulled off, with a view, by applying a sponge, to hinder the retreat of its contents into the system, when it instantly ran in under my eye, before the sponge could be properly applied, and that too on the under-side of the patient's leg, in opposition to centripetal attraction. Yet, in some of these cases, when induced by improper treatment, on a seasonable resort to a warm and cordial regimen, and to the proper internal remedy, one may the next day see the happy return of the matter in large blisters, at or very near the pustules it before filled (though now so far divested of its late keen contagious virulence as to be very uncertain to inoculate with). It therefore appears to me probable, that its retrogression was only unto the mouths of the lymphatics, which naturally inflames them, indurates their glands, and induces dangerous fevers, by the associate and sympathetic motions of the different parts of the system.

The writings of some transatlantic authors, formerly of credit, would induce a belief that it was once thought there, that the small-pox was not only modified in operation by particular scites and seasons of the year, but was frequently originated by these causes. These notions appear as the mere reveries of inexperience and error: but many descriptions of the disease, its operation and proper management, by writers of the best credit, such as Huxham's little black pock, which never was seen here in our day, &c. and many observations by Sydenham and others, his cotemporaries, equally variant from our experience, may perhaps be credited as then correct, by supposing a general change in the operation of the disease, gradually down the lapse of time from them to us; which is to me the more probable, because I think I can distinctly trace, by memory, a transition of this kind since I began to practice in the disease, which is about twenty-eight years. I see no more of the glandular suppurations in the latter part of the disorder, formerly so frequent and unavoidable. I can say almost the same of the rash, an eruption so common formerly at the close of the eruptive illness. Also the scarlet, or sometimes crimson efflorescence, well described by the acute Dr. Brown (Elem. Med. p. 219 and 421); also a border of like appearance round the inoculated spot on tender infants, near the time of eruption, varying in different shades of delicate colours to the eye, in transient and momentary flushes. The two last I have not seen these ten or twelve years, though formerly

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of pretty frequent occurrence in my practice. And, in general, I think it evident that the small-pox here hath grown far more mild and manageable than formerly, under similar treatment.

ARTICLE V.

REMARKS *on the* EFFICACY *of the* EXTRACT *of* HEMLOCK *in the* CURE *of* TETTERS, *and particularly in the* CURE *of an inveterate* DISEASE *of the* BLADDER. *By* LOUIS VALENTIN, *M. D. late Physician of the French Forces in St. Domingo. Communicated by Professor* BARTON, *of Philadelphia.*

M. DAVID, an inhabitant of Cape-François, seventy-seven years of age, was tormented, for more than three years, by a strangury, for which he had taken the advice of many gentlemen of the faculty, and had used unsuccessfully a great variety of means, both internal and external; and finally bougies were introduced into the urethra. At length he called for my advice, about the latter part of the year 1791; and, amongst the exact accounts of his life, he observed that, twenty-eight years before that period, having been obliged to go to France, on account of an obstinate abdominal dropsy, he abstained entirely from all kinds of drink during twenty-five days on board of the ship, eating only, for his sustenance, some dry food; that when he landed at Bordeaux his belly was very much lessened, and in a short time after the cure was completed without any medicine. Some time after his return to St. Domingo, at the quarter of Dondon, near Cape-François, where his estate was, the dropsy began again to appear; and, in a second voyage, he was thoroughly cured by a methodical treatment under a French physician; but he was very sorry to be obliged to confess that he had abstained from drinking water only fifteen days in his passage. Thereupon he concluded that, being able to do in some degree without substantial food, he was determined to take any advice that I should give him, in order to alleviate the severity of his sufferings.

M. David had almost always lived a regular life, and his blood had never been infected by the venereal disease. His constitution was dry and lean. Having examined his disorder,

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I saw him making water by drops, with burning pain in the urethra, chiefly in the neck of the bladder; and, during one hour, by reiterated contractions and efforts, he never discharged but one, two or three spoonfuls of urine. He was afraid of drinking any more, lest it should disturb his rest, of which he had been so long deprived. No obstacle was in the canal, no tumour in the rectum intestinum, nor in the prostate gland. The hypogastric region was nearly in a natural state. A looseness now and then disturbed and weakened him much.

There might be two immediate causes suspected—a stone in the bladder, or a particular disease in the membranes of that organ. Having introduced a sound, and after exploring attentively, I discovered no extraneous body; but I could not turn about my sound in its cavity as in other men. I found every where by the end of the sound a resistance as in a pocket of leather. I thought that a catheter of elastic gum might be useful in order to let out the superabundance of water, which the bladder could not hold without the most acute pain. But it was impossible for the patient to endure the catheter even two hours, notwithstanding his extraordinary courage. The half baths, the emollient topics, and all drink or other lenient medicines whatever, had never relieved him but for a moment.

Amongst my inquiries about remote causes of an old disorder, I learned that he was subject to the erysipelas and tetters; and showing me his left leg, I perceived a great mark of a ring-worm upon the inside of it, which itched so extremely that it caused him to scratch off the skin. Instructed already, by experience, in the effects of the repulsion of some acrid humour from the skin, and even of the gout and rheumatism upon the *viæ urinariæ*, I was induced to believe that his bladder could be affected by nothing but the humour of the ring-worm; that the membranes of it were thickened and hardened, and the size of the cavity decreased considerably in proportion to the length of its pathological state; and therefore the patient could not delay to evacuate a small quantity of urine, the contact of which provoked an irritability already much increased.

I began the cure with two pukes of ipecacuanha root, as much on account of the lax as to excite a shake from the centre to the circumference. Afterwards I ordered the extract of hemlock, increasing every day the dose, with six, eight or ten grains: soon it was brought up to a drachm. Then I

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continued the same weight more than a month, until he got rid of a great propensity to sleep (which he felt every day after dinner), and of some convulsive motions in his lips. The dose was after that increased to three drachms every day. I then perceived that the bladder kept in a great quantity of urine, and its extreme sensibility was much abated. However, an abounding excretion of spittle, with an inspissated mucosity, without any affection, either of the throat, the tonsils, gums, &c. was an inducement to diminish the dose for a short time.

Our patient drank also the juices of some of the depuratory herbs, but the diarrhœa coming on, he forsook them. I ordered to renew the dose, by degrees, to three drachms. He indured it perfectly well; and, in the sight of every body, he evacuated without interruption, and almost without any pain, a large tumbler full of urine. He felt that the bladder was more extended, and that he could contain his water a long time. He went from home with a design to take a walk, what he had not done for three years past, being obliged to stand every moment, in order to make a few drops of water.

The ring-worm of the leg and the itching appeared no more. I had fixed a cautery under the knee of the same side, but it never discharged any matter. All the irritating and stimulating topics on the tetter, though in a small quantity, brought their action into the bladder and the canal of the urethra. I forsook them to wash only the leg with the decoction of althea.

In fine, sleep and the other functions of that age (the appetite excepted) were restored, after the use of the hemlock, in one year. In computing exactly, in every particular, the quantity of that extract, we found that M. David had taken sixty-four ounces of it, or four pounds. (There are sixteen ounces in the French pound.)

Some time after this cure, an insurrection happened in the town, in which one party attacked another. M. David being quietly seated down at home, near the door, St. Simon's-street, was, by chance, struck in the breast, and killed immediately, by a gun-shot, which was designed not for him, but for a horseman who was escaping. I seized upon this occasion to open the dead body, and I called Dr. Baradat with a design to examine the bladder with me. We found it sound, smaller than in a natural state, and its membranes but a little thicker about the lower part.

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REFLECTIONS *on the* EXTRACT *of* HEMLOCK *(Conium Maculatum.* Linn.)

We see, by the above observation, not only the good effects of this remedy, but also the strong dose which the patient has borne without inconvenience (the inodorous salivation being excepted), when three drachms every day were taken. I have always ordered strong doses of it, and it never produced that last effect. It might, perhaps, be said, that the extract of hemlock contained mercury; but it is wrong, for no experiments have given any proof on that subject. It was fresh and well chosen, and appeared to be very good, being procured from Messrs. *Saussay & Brus*, apothecaries at the Cape. The same remedy has never produced that effect in any other instance; having made a copious and successful use of it in the cure of obstinate tetters in the West-Indies, some time together, with the strained juices from herbs of a soapy and nitrous quality.

However, I have recently seen at Norfolk, in Virginia, a person to whom I prescribed the extract of hemlock, by degrees to one drachm *per diem*, casting up a great deal of spittle, afflicted with a sore throat, sore gums, tonsils, &c. Gold, when rubbed with that medicament, would become white immediately, and I discovered easily the quick-silver. It was a mixture of Bellost's pills and a small quantity of extract.

Every physician knows how exceedingly the extract of hemlock has been praised by Dr. Storck for the cure of cancers; but numerous experiments have proved its insufficiency, not to say its inefficaciousness; and its virtues in those cruel diseases are now come to nothing, as well as the praises and boastings of its admirers. It is not the case as to the diseases of the skin, ulcers, and some oppilations issuing from them, and even sometimes from a venereal disease, after an unsatisfactory treatment with mercury. The climbing morel *(solanum scandens seu dulcamara)*, so celebrated by Dr. Carere, of Paris, and lastly by Dr. Otto, from Gotha;* the bark of the pyramidal elm, by Dr. Banau; the soap-wort *(saponaria officinalis)*, by Dr. Retz; the antimony of Jacquet; and a great many other chemical compositions, which, nevertheless, are not to be rejected, seem not to produce so good effects as the mere extract of hemlock, especially when its use is combined with a vegetable diet and exercise. All animal and

* Dissertatio Medica de Usu Medico Dulcamaræ. Printed at Jena.

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greasy food, fit to increase or maintain the bilious plethora, ought to be interdicted; for the remote causes of those disorders exist undoubtedly in the organs of digestion, which have a great connection with the skin, but essentially in the liver. Therefore Galen says judiciously: "*Herpetes biliosus procreat succus.*"*

This remedy must have an excellent effect, taken in sufficient doses, and continued a long time. At St. Domingo I joined with it the cold bath; I repeated, from time to time, vomits with tartar-emetic, preferring often a drink with vinegar, sugar and water, to that of sarsaparilla decoction. Sweats are in those cases always salutary, but they must not be provoked with hot and acrid sudorifics. Among the five kinds of tetters with which we are acquainted, the *herpes pustulosa et squamosa*, and the *herpes viva et suppurans*, are there the most common; and often many people are cured by changing the climate only.

The desiccative and repelling ablutions and liniments are sometimes employed successfully, but it is only about the end of the treatment, and they must be prescribed cautiously.

Permit me to observe, that the alkali volatile fluid, and the sudorific syrups of mercury, which some surgeons of St. Domingo make use of, have frequently produced pernicious effects. Mercury is very noxious when there is not a venereal taint; and those ring-worms do not originate often from it, as is commonly believed.

ARTICLE VI.

MEDICAL HISTORY *of* BLOCK-ISLAND *for the Year succeeding the Autumn of* 1801. *By Dr.* AARON C. WILLEY.

BLOCK-ISLAND is an appendage to the State of Rhode-Island, lying in lat. 41 deg. 10 min. N. long. 71 deg. 40 min. W. from Greenwich, 21 miles S.S.W. from Newport, and 19. 5 E. by N. from Montauk-Point. Its aboriginal appellation is Manisses. "It was erected into a township, by the name of New-Shoreham, in 1672." A chain of large ponds extends from the north end to nearly the centre. These, with several other separate and smaller ones, compose about one-seventh of

* Gal. Meth. Med. lib. xiv. cap. 9.

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the island. The land, in general, is high, and on the western part very uneven, being much diversified with precipitous hills and narrow dales. The eastern part is more disposed to gentle risings and descents. The soil is various; sandy, loamy, and argillaceous, with considerable quantities of peat. In the progress of rude cultivation it has become entirely destitute of trees, except now and then an old solitary memorial of its once beautiful groves. Fruit-trees find not here the nourishing care of man. Peat is the only fuel. The water made use of for drink, and the various processes of cookery, is taken from springs or ponds, and, for the most part, slightly impregnated with alumine, iron, and muriate of soda. The inhabitants consume an unusual quantity of ardent spirits, tea, snuff and tobacco.

Respecting the diseases of the island, from its earliest settlement to the invasion of the yellow fever in the summer of 1801, nothing satisfactory can be obtained. The facts pertaining to this subject have never employed the pen of genius; and, as to traditionary accounts, they are at all times vague and inconclusive. The yellow fever of last year I have treated of in a former dissertation. This was followed by a remarkably moderate winter, with but little snow. The ground was so free from congelation in January as to admit of being ploughed. The few febrile cases which occurred were of an inflammatory nature, and yielded to the depleting and antiphlogistic plan. In every instance traits of the late epidemic were highly conspicuous. The spring was wet and cool; vegetation backward. In March and April a catarrh was frequent among children. It was constantly attended with dyspnœa. May, June and July were wet and cool, except a few days in July. In this last month, the island, for a great part of the time, was enveloped with fog. No febrile complaint worthy of notice occurred till the 4th of August, when I was called upon to visit an unmarried female, of middle age. She was seized with a violent pain in the fore part of her head—pain and soreness of the eyes, accompanied with a defluxion of humours—pain in the back and bones—soreness of the flesh—lassitude—dry skin—thirst—anorexia—tongue moist, and covered with a brown fur—rigors, succeeded by flushes of heat, and full, frequent pulse. I let blood, and administered a dose of calomel and jalap. This, with some febrifuge preparations, arrested her disorder, and in a few days she was well.

The same day a lad, aged fourteen years, was attacked in

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a similar manner. I let blood, and administered drastic purges, but in vain. His disorder was obstinate, and progressed with unabated violence. Dyspnœa and delirium soon acceded, and he died in a state of stupor on the eighth day of his malady. Two more of the same family were seized with the first symptoms of this fever; but, by an early use of venesection and active cathartics, they soon recovered.

August 14th I was called upon to visit a girl of about 14. She was in the third day of her fever. I found her with pain in the head, back, &c.—vertigo—nausea—perverted taste—dry skin—aversion to light—tongue moist and brown—pulse full, but not frequent, dejection of spirits, &c. I let blood, and exhibited calomel and jalap. This increased the frequency of the pulse, and rendered the febrile affections more distinct. On the 16th there occurred pains in the stomach, oppression, diaphoresis, yellow tongue, costiveness, and singultus. The pain was alleviated by camphorated tincture of opium, and costiveness removed by sulphate of soda. The other symptoms gradually subsided. Convalescence was attended with a yellowness of the skin.

The weather continued humid and cool for the season, with less fog.

From the middle to the last of this month, cases of cholera, attended with an unusual degree of pain, were frequently occurring. These were treated by exhibiting opium in quantity sufficient to mitigate the pain, quieting the stomach by anticmetics; after which calomel was given to deterge the primæ viæ, and promote the action of the absorbent system.

On the 29th I was requested to visit a married woman, aged 24, of gross habit and robust constitution. She complained of violent pain in the anterior and posterior part of the head—pain in the eyes, thoracic region, stomach, back, and bones—vertigo—intolerance of light—languor—lassitude—nausea, and ejection of green bile—thirst—great heat, and diaphoresis. Her tongue was moist and white; pulse strong and frequent. I employed blood-letting, and exhibited calomel and gamboge. The blood, when separated by standing, showed a large proportion of crassamentum settling to the bottom of the vessel in saffron-coloured serum. The medicine operated both as an emetic and cathartic, evacuating green and dark-coloured bile. The next day the pains were considerably abated; the pulse softer, but quick and frequent. The nausea and puking still continued. I put her upon the antiphlogistic plan, with columbo in substance, and the essential

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oil of peppermint: but this not appearing to check the progress of her disorder; the pains beginning to increase, with the accession of yellow tongue, oppression in the region of the præcordia, burning in the stomach, paracusis imaginaria, and dry, starchy lips, I applied an emplastrum cantharidis between the shoulders, and administered calomel, in small and reiterated doses, till it affected the salivary glands. This was immediately followed by convalescence, and she was shortly able to walk about.

Numbers were invaded with the premonitory signs of this fever; but by early venesection, and an exhibition of calomel, the impending disorder was happily averted. Many of these were succeeded by diarrhœa. The most sovereign remedy for this was acetate of lead. It was given in honey or molasses, in doses from one grain and a half to four, every two or three hours, as the exigency of the case demanded.

September and October were cool, with the common portion of rain. No peculiar disorder occurred worth recording.

From the foregoing history of diseases I think we may safely make the following conclusions:

1. That these cases of fever were of the same nature as the yellow fever of last year.

2. That the fever, cholera, and diarrhœa, arise from the same causes.

The causes of malignant and epidemic disorders, exclusive of the proximate, may properly be considered as *remote*, *predisposing*, and *exciting*. The *remote* consists in a morbid constitution of the atmosphere; the *predisposing* in a diathesis, or peculiar condition of the animal system; and the *exciting* is that principle which, by contact with excitable parts, produces diseased commotion, or a vitiated derangement of the functions. Different causes have been too generally assigned for different disorders, and for different appearances of the same generic disorder. This is an error—an error which has prevailed from the earliest ages of medicine, and which still holds its empire in the minds of a great proportion of our physicians. Nature ever delights in simplicity. Her agents are not so multifarious as erring man is apt to imagine. This is highly conspicuous in the production of those maladies to which we now advert. Pestilential, intestinal, and, perhaps, many other diseases, with all their various aspects and grades, are, in general, owing to the extensive operation of the same morbid powers. But the number of these are extremely circumscribed. The most potent, durable, and widely

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different, is the *remote*, or Sydenhamian constitution of the air. In what this consists, is, perhaps, difficult to explain. Some have supposed it to be a superabundance of the hydrogenous, others of the oxygenous portion of the atmosphere; while others, with more plausibility, have conjectured it to be a modification of electron. I am rather inclined to conclude that it is an occult principle, operating in a manner *sui generis*—a principle hitherto eluding the assiduity of philosophical research, the developement of which will one day form a brilliant æra in the annals of science, and immortalize the memory of a second FRANKLIN. The subject, however, affords a spacious field for the inquiring mind to explore.

The *predisposing cause* is commonly the effect of a combination of active agents and contingences. The leading and most influential is the *remote* already noticed. This, in co-operation with the sensible qualities of the air, and in connection with the manner of living, the primordial structure and motive evolutions of animal organization, produces the peculiar diathesis favourable to the action of exciting powers.

The *exciting cause* is septon, oxygen and caloric, chemically united, and constituting septic acid. This is spontaneously generated two ways—by electrical agency, and by the process of putrefaction. The first seldom produces it in sufficient quantity to induce febrile affections. It is formed by putrefaction in the intestinal canal, and upon the surface of the earth. The former is commonly the exciter of solitary cases of fever, which so frequently occur; the latter of endemic. To trace the mode in which the acid of septon is formed, the circumstances which favour its generation in the first passages, its various states, and manner of disordering the economy of living bodies, is not the design of the present essay. The object of these brief remarks is only to illustrate the doctrines which they embrace, by showing their connection with incontestible fact.

It is presumable, and with the highest probability, that those febrile diseases which occurred the last summer were owing to the same causes as the epidemic of 1802; viz. a morbid constitution of the atmosphere, continuing, "under all the circumstances of wet and dry, of hot and cold weather," a synochal diathesis of the animal system, and the insalubrious acid of putrefaction. Had the septic vapour prevailed this last season as in the former, the fever would have raged with equal malignancy. But the generation of this deleterious gas was impeded by an excess of moisture, and a want of a con-

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petent degree of heat. But it was formed, however, in sufficiency to excite its noxious power on those who respired the air in which it was diffused.

The fever, cholera, and diarrhœa, were evidently the production of the same causes, acting upon different parts of the system, and with different degrees of violence. The circumstances of their co-existence, and of their quick succession in the same person, tend greatly to confirm this opinion.

The two last summers have here exhibited instances of the domestic origin of malignant disorders. Not the least appearance of their importation can be found, while their indigenous source can be easily traced. Indeed, the doctrine of imported contagion is *mostly passing away*. A few years more, and it will be known only by the page of history.

Block-Island, Nov. 12, 1802.

ARTICLE VII.

A Case *of* Trismus *cured by* Laudanum. *By* Richard Hazeltine. *Communicated by Dr.* D. Hosack.

SUNDAY evening, December 6th, 1801, I was called to visit Capt. T. L. of Sanford. About two weeks before, he had received a small wound directly on the last joint of the thumb of the right hand. The wound was so small, and seemed so trifling, that he took little or no notice of it till Thursday evening, December 3d. It had nearly healed, when, on Wednesday, December 2d, he accidentally hurt it, and tore it open. Thursday evening it became painful, and continued so on Friday—the pain extending up the arm; and on Saturday it affected his jaw. Saturday evening he was suddenly seized with stiffness in his limbs and body, and in the muscles of his jaw. He also felt a pain in the œsophagus, and some disagreeable sensation in the act of deglutition. A mild bilious diarrhœa came on at the same time, attended with some pain. The rigidity was so sudden and universal, that, being in an erect posture, he fell down on the floor, and was helped to the bed. Sunday, some time in the day, he felt a pain under the sternum, which extended to his back.

I found him as follows: His jaw was so set that it would barely admit a goose-quill: this had been the case twenty-four hours. His thumb was extremely tender and painful. He was

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affected with pain in his limbs, accompanied with frequent convulsive twitchings, like subsultus tendinum; also with pain in his bowels, attended with loose, though not very frequent dejections, distress at his stomach, cool extremities, *weak, small* pulse, and *slower* than natural. The pain in his jaw was not constant, but the rigidity was without intermission.

He was a person of a bilious temperament, and had often been troubled with paroxysms of bilious colic. He had enjoyed little or no sleep during the last twenty-four hours, had felt no appetite for food, and had taken none, of consequence, for several days. The circumstances of his family, for several months past, had been such, that he had experienced not a little bodily fatigue and mental anxiety, as well as occasional indisposition and ill health.

Before this I had *seen* but *two* cases of tetanic affection; one of which, as it came under my care (in 1798), I recorded, and communicated to a gentleman of the Medical Society of this commonwealth: the other occurred in this town in September last, and came under the care of others of the faculty. Both cases proved fatal. My studies and my reflections, in the course of my practice, had frequently turned on the nature of tetanic complaints; and I had adopted a theory, respecting the propriety of which I felt somewhat confident. My reflections had been such, that in this case I did not hesitate a moment what plan to pursue. It appeared very clearly to be owing to debility in every part of the body, without preternatural excitement, except in the muscular system, and without plethora. In such a case I presumed opium would certainly prove efficacious and curative, if given in sufficient quantity; and I would admit no limitation in the use of it till it should produce a relaxation of the spasms. This was the criterion, in my mind, by which to judge when I had given enough: this was the boundary-line in my view; and I was determined to exhibit opium (or laud. liq.) till that effect was produced, *i. e.* till I had obtained a complete relaxation of all spasm or convulsion, or, in other words, till the opium had induced *ease* and *sleep*.

I began with sixty drops of liquid laudanum at 12 o'clock at night, and repeated that dose every hour. My laudanum, in that dose, was equal, I am confident, to not less than two grains of solid opium. I accompanied the laudanum with an infusion of valerian and Virginian snake-root, which I gave principally with a view to the disordered state of his stomach and bowels. After he had taken three doses of the lauda-

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num; he opened his mouth so as to admit my finger, and I gave him two of the quicksilver pills of the Pharm. Ed. nov. I had given him seven doses of the laudanum, of sixty drops each, before sun-rise, and six of the mercurial pills. After taking the fifth dose of the laudanum, he said he could open his jaws as well as ever; but I rather doubted it; for I perceived, or rather suspected, that he made the declaration from the fear that I should give him more of the laudanum than would be safe: therefore I gave him the sixth and seventh doses before I left him, which was about sun-rise. When I left him, the medicines had completely removed his spasms, pain and uneasiness in every part of him, and he had been able to obtain some sleep. He said he felt relieved in every respect. Through the night I poulticed his thumb with bread and milk. I ordered him to apply the common plaster, to continue the poultice to the thumb, to use the laudanum as he might find necessary, and the pil. merc. so as to affect his mouth if possible, and to take some broth, &c. if he could.

Tuesday, December 8th, I found him comfortable. He had experienced no return of the spasm after I left him on Monday morning, except in the evening of that day, when it recurred, but readily yielded to a dose of the laudanum. I made little or no alteration in my former directions, excepting that I gave him a dose of rhubarb and calomel, in order to remove a pain which he still complained of in his bowels.

Thursday, December 10, I found him entirely free from spasm, which left him the evening before; since which he said he had constantly felt as if he had been disjointed in every part of him; he felt so weak and relaxed. He now spat freely: his pulse was regular and his heat natural. I left him more laudanum, and some occasional medicines, such as some laxative pills and bitters, and thought him out of danger if he was careful.

Ten or fourteen days afterwards he was so well that he rode on horse-back ten or a dozen miles to a relative's, where he was taken unwell, and threatened with a return of the spasms; but, by the seasonable use of some opium which he obtained from a physician in the place, the symptoms vanished. At this time the sore on the thumb broke out again, as it appeared not to have been healed from the bottom before; but, by the use of some common applications, it healed perfectly in a short time.

Berwick, Doughty's Falls, July 5, 1802.

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ARTICLE VIII.

Remarks on the late Mr. George Lee's *Account of a* Morbid Dissection; *Communicated to Dr.* Mitchill *by an anonymous Correspondent.*

To dispute an established custom, or advance a new theory, requires great ability, ingenuity, and, let me add, interest; however plausible the new adduced arguments may appear in the eyes of a few, whose minds are apt to change always with what last presents itself to their notice. But, Sir, it is no small advantage to society, that gentlemen of the faculty are more upon their guard than to listen to every supposed improvement in surgery, medicine, or anatomy.

In looking into the fourth volume of the Medical Repository, p. 138, I find a very ingenious and learned account of a dissection, written by Mr. George Lee. He asks, "If there was no absorption during the growth of bones, how could their cavities enlarge? and if new layers of bone were not formed on the external surfaces of them, how could they be extended?" I must beg leave to differ with that learned gentleman in opinion respecting the similarity of bone and wood: for we know, contrary to what he hath advanced, that the bones of an infant and the most mature adult are *alike* composed of an equal number of layers or tablets. We also know that the cavity always increases with the size of the bone; not as wood, whose outer layers, compressing, as they grow, more closely those within, not only prevent the enlargement of cavity, but, consequently, bring on a diminution, as we see plainly by cutting a tree, where we find in the younger or daughter branches large cavities, and in the larger or mother branches the cavities are considerably diminished in diameter; while the parent stock of the same tree is altogether without cavity, although formerly much excavated. The cavity of the trumpet, and other such trees, does, indeed, keep pace with the enlargement of the trunk; but we are to consider that they are composed of but one layer from first to last, and will rather serve to confute than elucidate his argument.

Mr. Lee mentions his having attended a woman who fractured the bones of both legs by only stepping obliquely upon the edges of bricks. Had he favoured his readers with the time of the year, or the particular state of the atmosphere when this happened, the information, I doubt not, would

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have been more satisfactory. I remember being called to the assistance of a woman who had fractured the tibia by a false step on a very smooth pavement. One of the broken ends of the bone lacerated the adjacent muscles, and projected about an inch without the cutis. The bone was as thick as any I have ever seen. This happened in winter, in frosty weather —the time fractures are known to be so common. The woman, at the time, was young, and far advanced in pregnancy. She soon recovered, and in due time parturated, without any symptom for alarm. I have known other instances of fractures from a like cause, but the bone not appearing, their thicknesses could not be accurately known.

Mr. Lee's opinion on the absorbent system does not, I confess, agree altogether with my own; and I shall endeavour to account for the dissolution of bone in the animal machine in another way.

I, and I believe many others, know that diluted muriatic acid is capable of dissolving the bones of animals, while the muscular and other soft parts remain in perfect form, although corroded: and I am of opinion that, by a skilful management, the bones of a body may be thereby dissolved, and apparently obliterated; leaving the softer parts in an apparent state of symmetrical form, with a considerable degree of elasticity. This ossivorous acid reduces the bone to the consistence of tallow, granulated, and white. I therefore am led to suppose the substance found in the cavity of the abscess no other than the remains of bone. May we not, therefore, attribute this dissolution of bone to a sub-marine acid state of the contained matter, which, while it completely destroyed the ribs under the pectoralis major, and within the sphere of its own circumference, left the cartilaginous and other softer parts in a state nearly natural? From this a favourable prognosis may be inferred, for the guidance of the physician and surgeon, both as to the remedies proper to be employed, and also for the better making the requisite incision.

Although every surgeon cannot but be acquainted with the most proper mode of operating in such cases, yet it is proper for writers to be correct in their statements. I shall only quote Mr. Lee's own words, and close with my best wishes for the improvement of a profession founded on principles the most humane. "The tumour was opened twice by Dr. Physick, and discharged, at *both* times, five pints of glare." * * * * * * * * * "He threw up from the lungs, before death, the same kind of matter which was discharged from the tumour by the *puncture*."

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ARTICLE IX.

METHODS *of treating* HYDROPHOBIA *from the bite of* RABID ANIMALS, *extracted from German Authors: In a Letter from* JOHN G. KNAUFF, *M. D. to Dr.* MITCHILL, *dated Albany, January* 15, 1802.

HAVING read, in the Medical Repository, several statements of cases of *Hydrophobia Idiopathica sive Contagiosa*, and not finding in them the more effectual treatments recommended by modern writers, the effects of which have been sufficiently proved by many experiments made with them, I thought proper, notwithstanding my deficiency in the English language, to recommend the following extracts and translations to your readers, and to the public in general. For I consider it to be the duty of every individual to contribute all in his power to the prevention and cure of such a dreadful disease. The common methods of treatment are sufficiently known to be ineffectual.

The Rev. Muench* has published a short introduction of a new method of treating the bite of rabid animals, by the application of the *Belladonna (Atropa Belladonna Linnæi)*, or *Solanum Furiosum, Solanum Lethale*—Deadly Nightshade in English.

The directions how it is to be administered are in the following manner: The powder of the root *(Pulvis Radicis Belladonnæ)* is preferred to that of the leaves *(Folia Belladonnæ)* in the prevention and cure of the malady now under consideration. Two grains of the first are equal in strength to three and a half or four grains of the latter.

This medicine appears to operate chiefly by inducing perspiration. There are some persons who hardly ever can be brought to a perspiration, and with whom the belladonna, though taken in the strongest doses, has no effect in that way. With such persons it will commonly occasion a considerable swelling on the part infected with the poison. This swelling will appear principally with the first dose; with the second it diminishes; and with the third it entirely disappears. Sometimes a traction *(ein ziehen)* will appear in the wounded part during

* See "Muench's Kurze Einleitung, wie die Belladonna sowohl by Menschen als Thieren im tollen Hundsbiss anzuwenden sey. Goettingen. 1783." Muench's short Introduction of the Application of the Belladonna in the Bite of a Mad Dog on Men and Beasts. Goettingen. 1783.

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the use of the *belladonna*. This traction must entirely cease before the medicine can be discontinued.

As soon as possible, after the person is bitten, a dose of the *pulv. rad. belladonnæ* is to be given internally; after 48 hours a second dose; and after 48 hours more a third. If, during the operation of the third dose, some swelling still appears on the wounded part—the traction therein has not entirely ceased—and the wound is not dry—a repetition of the belladonna, with five doses this time, is prescribed, after an interval of 72 hours, in order to give some time to the patient for recovery; to be administered every second day, like the first three doses.

Should it happen that the medicine operates too powerfully on the patient, so that he can not recover himself on the second day, a dose may be directed every third day; but this must not be done unless required by necessity.

The powder is to be taken with a little broth, or the like, when the patient is to go to bed, and the dose will operate. If a dryness in the mouth and throat appears, some cold water or milk may be taken; and if he is inclined to sleep, he may without molestation. On the following morning, if the powder has been taken in the evening, he may take some warm tea, and remain in bed some hours longer for the promotion of sweat.

Should the first dose occasion a *diarrhœa*, the second is not to be administered until that ceases. If a weakness of the eyes appear, or a *diplopia*, they are not to be strained with reading, &c.

If the symptoms of *hydrophobia* appear, notwithstanding the use of the belladonna, or if it has not yet been administered, increased doses must be continued in case the first or second should not arrest those symptoms. The patient must be kept in bed, plenty of sweet-milk given him if he can yet swallow, and blood taken from the foot. If a perspiration succeeds the paroxysm will soon be at an end.

The dose must vary according to the age, constitution and disease* of the patient. A weakly person requires always a deduction of some grains from the ordinary dose. The following will precisely fix the dose for a strong and healthy person, of robust constitution; supposing the disease to be occasioned by the bite of a rabid animal.

* I think it necessary to mention, briefly, that the belladonna is recommended in several other diseases; in some of which, as *hysteria*, *mania*, *melancholia*, and *obstructions*, I have administered the *pulv. foliorum belladonnæ* several times, with good success. The dose of the *folia*, in such cases, is from two to five grains.

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To a child one year old, one grain of the *pulv. rad. belladonnæ* is to be given in breast-milk, for the first dose; the second and third are to contain one grain and an half each. It may take the breast, during the operation of the medicine, as often as it pleases. At this period children will generally be red-coloured over the whole body. A child of two years of age requires two grains for a dose: of three years, the first dose two grains, the second and third from two and an half to three grains. From four to five years of age, the first dose two and an half grains, the second and third three, three and an half, and four grains. A child of six or seven years old, the first dose four grains, the second four and an half, and the third from five to five and an half grains. From eight to nine years, the first dose four and an half, the second and third from five to six grains. From ten to eleven years, the first dose five grains, the second five and an half, and the third six and an half. At the age of twelve or thirteen years, the first dose six, the second seven, and the third eight grains. From fourteen to sixteen, the first dose six and an half, the second seven and an half, and the third eight and an half grains. From the age of seventeen to fifty years, the first dose ten, the second twelve, and the third from thirteen to fourteen grains. Women generally a little less. From fifty to sixty, the first dose six, the second eight, and the third nine grains. From sixty to seventy, the first dose four or five, the second and third from six to seven grains. From seventy to eighty, the first dose three, the second and third four grains. For a woman who nurses a child, the first dose is three, the second four, and the third five grains.

But in order to be convinced that the above fixed doses are suitable to the age and constitution of the patient in every particular case, it is necessary to notice whether the first dose occasions a very profuse sweat, or whether that part, in case this sweat does not appear, to which the poison has been communicated, swells up very much. If the one or the other appears, it is only necessary to continue the above-mentioned increasing doses; but if this does not happen, they must be augmented. In general, the first dose has a stronger operation than the succeeding ones, notwithstanding their being increased, as above directed.

If the first dose operates so harshly that the patient does not fully recover on the following day, the second dose is not to be increased.

The *pulv. foliorum belladonnæ* has been administered with

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the best success in the bite of the viper *(vipera)*. The dose is, in this case, for robust persons from sixteen to fifty years of age, from five grains, increased by degrees to nine, every twenty-four hours.

The method of Dr. Schmucker,* first Surgeon-General of the Prussian army, is now generally combined with the above, and has seldom failed of success in the prevention of *hydrophobia*, if applied in time: nay, even when the poison has begun to enter the blood, it has often proved successful. It is the following:

As soon as possible after the person is bitten, as also if the wound should be healed up and dry, or if, after some time, the first symptoms of the poison entering the blood should appear, the scar, or the wound, as the case may be, is to be deeply scarified, and the hæmorrhage promoted by the application of a *cucurbita sive ventosa*; after that, the *pulvis cantharidum* is to be rubbed into the wound, and upon that the *emplastrum vesicatorium*, according to the size of the wound, applied. The sore occasioned by the blister is to be kept open, and the suppuration promoted by a continual dressing with the *unguentum basilicum*, mixed with a fourth part of the *pulv. cantharid.* If the suppuration increases plentifully, the sore may be dressed, now and then, with the *ung. basil.* alone; and, from time to time, as circumstances may require, the *ulcer* is to be irritated with the *cantharides*, to promote and continue suppuration, during the term of eight weeks, or longer. Should pain and a considerable inflammation appear, an emollient cataplasm may be applied. A powder, consisting of *nitre* half a drachm, and *camphor* two grains, is to be administered internally, four times every day.

In a letter of Professor Mederer,† a new remedy for the prevention of *hydrophobia* is proposed. Its principal virtue, says the author, consists in its preventing the poison from entering the blood: and this is not improbable, as the virus remains in the wound for weeks, even months, without action, before it is absorbed. To accomplish this, the extirpation of the wound with the *knife*, or the *cauterium actuale*, is sufficient; but as this is not practicable on all parts, he recom-

* See "Schmucker's Chirurgische Wahrnehmungen, Zweyter theil, seite 544." Schmucker's Chirurgical Observations, Part ii. p. 544.

† Entitled, "Methodus facillima et certissima Homines et Animalia cuncta a Bestiis Rabiosis Admorsa conservandi, ne quoque in Rabiem deveniant. Friburgi. 1783."

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mends an easy and certain remedy. It is a solution of thirty grains of *lapis causticus* in one pound of water.

The wound is to be washed with this solution several times in a day, after it has been enlarged and cleansed as long as the inflammation will permit. If an inflammation already exists, it must be subdued before the application of the solution. If the wound be closed, the *lapis causticus* is to be applied as a *cauterium potentiale;* and after the *eschar* is removed, the solution is to be used as above directed. If the wound is not very irritable, lint may be moistened with the same, and applied.

This remedy has been administered to a number of persons bitten, and always prevented the fatal consequences, as appears from the annexed testimony of magistrates. But it cannot be of any use after the appearance of hydrophobia.

It is particularly observed, that the *lapis causticus chirurgorum*, or the alkaline caustic prepared of pot-ash and quick-lime, should be preferred; therefore it is probable the *causticum lunare*, or *lapis infernalis* (lunar caustic,) does not answer the same purpose, being a solution of silver in nitrous acid. This makes the infectious poison appear to be an acid.

In order to give a short specimen how such bitten persons are generally treated in Germany, and with what success, I will here insert the remarks of Dr. Thilenius on that head.

"I have directed," he says,* "those unfortunate persons to be treated according to the directions of Dr. Schmucker, with deep scarifications—the succeeding hæmorrhage promoted with the ablution of warm water—the *cantharides* applied to the wound—*camphor* administered internally, as also two or three times the *belladonna;* and they have *all* been secured against the melancholy consequences. The ulcers I have caused to continue from four to six weeks. And in this treatment I have more confidence than in the *belladonna, anagallis, mercurius, meloe majalis*, &c."

But, notwithstanding these authorities, I cannot forbear to mention, that these methods have also sometimes failed, according to other reports; so that none can boast of an infallible remedy, as is sometimes the case, and, by its failure, bring the same into disrepute: for, of what remedy or method in any disease can we boast as being infallible, without appearing in the character of quacks?

* In his "Medicinisch und Chirurgische Wahrnehmungen. Franckfurth am Mayn. 1789. Seite 249." Medical and Chirurgical Observations. Franckfort on the Maine. 1789. P. 249.

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As to my own experience with this remedy, I have nothing material to offer. I was bitten, but so recently (five-and-twenty days since) that I am unable to make any conclusion. I applied the caustic as above directed. One case, however, of another venomous wound, came under my care, which I will briefly state.

I was called, about eight or nine years since, to a girl about six years of age, in the town of Troy, who was bitten in the ankle *(malleolus)* by a young rattle-snake; and, at the time I visited her first, the purple swelling was extended over the whole leg and thigh to the abdomen, with a high fever and some convulsions. I immediately applied the *emplastrum vesicatorium* over the whole ankle, just covering the two punctures occasioned by the two teeth at once, and directed camphor internally, which removed all the symptoms by degrees, within 48 hours, without the least bad consequence.

Before I close I will take the liberty to add some remarks. Several observations in the Medical Repository, which seem to be stated in order to prove a kindred nature between hydrophobia and malignant fever, because black-vomiting* and yellow skin† appeared at the close of the catastrophe, and were a symptom of the latter,‡ confirm rather the opinion of Professor Stoll,§ that the raging fever can, in the first case, combine with any other sporadic disease, and is then a compound, far from the first, being a kindred of the one with which it is combined. And, secondly, that it was a symptom of the yellow fever, proves nothing more than that hydrophobia is a symptom occasioned by different causes; as, according to the observations of Dr. Theden, it has been a symptom of *phlegmone:* but from hence that eminent physician was not inclined to consider or treat it as *hydrophobia contagiosa.*

On this occasion I cannot forbear to recommend to some of your correspondents a little more circumspection in their treatment of the literature of other nations, with which they are not thoroughly acquainted; and not, with self-conceit, repeat the exclamation,‖ "*We are more improved in modern researches!*" when the reverse can be proved.

* Medical Repository, vol. v. p. 75.
† Ibid. p. 77.
‡ Ibid. p. 79.
§ Ratio Medendi.
‖ In Med. Rep. vol. iv. p. 125, it is asserted that "the Dutch and the Germans still continue the practice of cupping and scarifying. We are more improved in modern researches," &c. To confute this assertion, I have, at present, neither room nor inclination.

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REVIEW.

ART. I. *An Essay on the most eligible Construction of Ice-Houses: also, a Description of the newly invented Machine called the Refrigerator. By* Thomas Moore. 8vo. pp. 28. *Baltimore.* Bonsal & Niles. 1803.

A TREATISE on the *great error of American agriculture*, or shallow ploughing, which we reviewed in our fifth volume, p. 311, first made us acquainted with this sensible and practical economist. He has now turned his attention to another subject of great domestic convenience, and shown how the cold accumulated in frozen water during winter may be treasured up for summer's use. Mr. Moore does not, like many fashionable epicures, consider ice, in hot weather, as a mere article of luxury. Like a careful calculator of what is good and desirable, he views it as answering more valuable purposes. He has demonstrated that a receptacle for as much ice as almost any private family may want, can be made for an expense of twenty dollars or less. In such a magazine ten tons of congealed water may be stored during the winter, for the use of the ensuing hot season.

Mr. Moore has further proved, that the ice so treasured up may be turned to *profitable* account by the man of business. When taken from its repository, and put into his refrigerator, it cools butter so greatly as to add to its value in market. The writer has sold this refrigerated article to the inhabitants of Georgetown and Washington, in Maryland, at an advance of from 4d. to 5½d. the pound more than any other butter in market would bring. By this advance of price on butter alone, a farmer who has a large dairy in the neighbourhood of a market may soon receive money enough to pay for his ice-vault and his portable cooler. He may afterwards enjoy the profits of his improvement.

But the saving he makes is not confined to butter alone. By means of an ice-house the proprietor saves the *price of* salt on all the fresh butcher's meat, fowl and fish needed for his family, until the moment of cooking. There is no danger of sustaining any *loss by their becoming tainted or putrid* in excessive heats, for a week or longer. *Lamb, veal, fish*, and *all* similar articles of *small marketing*, may be nicely kept,

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and carried to the place of sale, without risk of spoiling, by the same means. And, indeed, *fruits*, *milk*, *cream*, and all other kinds of *drinks*, *meats*, and *perishable things*, may be kept from rapid decay in like manner, whether intended for domestic accommodation or public sale. An ice-house may thus be considered as one of the substantial appendages of a well-managed farm; an improvement in which convenience, health and profit are admirably united.

But instead of relating the whole history ourselves, we shall give Mr. M. an opportunity of telling his story in his own way: and on this occasion we request our readers to listen to him, as he lays down the physical principles concerning the passage of anticrouon (heat) into and out of bodies, and of their solid and liquid states, particularly of water. (p.6.)

"Water is converted into ice at the temperature of 32 deg. of Fahrenheit's thermometer; and, as long as any water remains in contact with the ice, the temperature of the ice will remain nearly stationary; but when the water is all frozen, the ice will gradually give out its heat to the incumbent atmosphere, until it acquires the same temperature. Ice, exposed to an atmosphere at any temperature above 32 deg. or, if placed in contact with any substance above that degree of temperature, will, in either case, be melted. The temperature of the earth, a few feet below the surface, in this climate, is generally found to be between 50 and 55 deg. If, therefore, a pit be sunk in the earth, and filled with the coldest ice (which may sometimes be obtained as low as 10 deg. by removing it from the water, and exposing it to a very cold atmosphere), the consequence will be that the earth will give out heat to the ice until the temperature of the mass is raised to 32 deg. the process of melting will then commence, and continue to go on as long as ice remains. But this process will not be as rapid as those who are unacquainted with the subject might imagine. It would seem, that as melting ice is always found to be at the temperature of 32 deg. that after the mass becomes raised to that degree, the smallest addition of heat would immediately convert the whole into water; but this is not found to be the case; to prevent it, one of the many wonderful properties of matter interposes, and which only enables us to preserve ice at all. This is the difference between water and ice in their *capacities for heat*. As I would wish to be clearly understood by every class of readers, and as I may probably have occasion to repeat this term, it will, perhaps, be proper to give a definition of it. The capacity

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for heat which a body is said to possess, is its propensity or power of imbibing and retaining a greater or lesser quantity of that fluid, and, at the same time, appear to be of the same temperature as a given standard, which may contain a much greater or smaller quantity. Thus, in the subject under consideration, the capacity of water for heat is greater than ice; it being found, by experiment, that ice, at the temperature of 32 deg. requires the addition of no less than 146 deg. of the same scale, or thereabouts, to reduce it to water. To elucidate the subject still further, let a pound of water at the freezing point (to wit, 32 deg.), and a pound of ice at the same temperature, be put in situations where they will both receive an equal quantity of heat: when the ice is all melted, it will be found that the water has acquired 146 degrees of heat, and, of course, will be at 178 deg. Or, take a pound of water at 178 deg. and a pound of ice at 32 deg. put them together and cover them in a fit vessel; the ice will be melted, and the mixture will be 32 deg. or very nearly.

"It appears, then, that ice at 10 deg. deposited in a pit as before mentioned, and being in this solid state capable of conducting heat, must receive a sufficient quantity to raise the whole mass 22 deg. before any will be melted. When the melting process commences, it will cease to be propagated to the internal parts, because all that is received at the surface will go to supply the increased capacity of the water; and this will be produced in direct proportion to the heat received; the whole quantity requisite to melt all the ice being just as much as would raise the temperature of the same weight of water 178 deg. The greater the quantity of ice, the longer it will be in melting, because there will be less surface in proportion to its weight; and experience has proved that the quantity may be so great as not to be at all melted, during a whole summer, in this situation.

"It seems, then, our whole business is to guard against the introduction of heat; and, in order to take effectual measures for this purpose, it is necessary to be acquainted with, and attend to, the following principles:—That heat is transmitted with more difficulty through some substances than others: that it passes through fluid mediums by transportation, or the interchange of particles; and not from one particle to another, as in solid bodies. The capacity of air for retaining moisture is greatly increased by heat. The power of air to conduct heat is increased more than four-fold by moisture. An unequal distribution of heat in fluids will always produce

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currents or interchange of particles; in general, those of the highest temperature will rise to the surface. There is, however, an exception to this rule in water: between the temperatures of 40 and 32 deg. that fluid is more expanded than at temperatures a little higher; and, consequently, those particles which receive a small additional heat will descend. To this extraordinary property in water is to be ascribed some of the most wonderful phenomena in nature, but does not affect the subject under consideration. Substances which transmit heat freely, such as the metals, are called conductors of *heat*; and those through which it passes with difficulty, such as wool, fur, are called non-conductors; and they are called good or bad conductors, or non-conductors, agreeably to their degree of conducting power."

Having stated these fundamental considerations, Mr. M. proceeds to describe the faults which are found in ice-houses of the ordinary construction, thus: (p. 8.)

"The foregoing principles and laws of heat being understood, will enable us to detect the defects of ice-houses in common use. In the most improved kinds I have seen, the ice is enclosed in a case of plank, or logs, within the pit; an interstice being left between the sides of the case and the pit, which is commonly filled with straw; the ice reposing on a loose floor of plank or logs, raised a little above the bottom of the pit. Let us now suppose the case just filled with ice, defended from winds and sunshine, but no straw, or other non-conductor, either at the sides or on the top; how will it be affected as the weather becomes warm? The particles of air reposing on the upper surface of the ice will soon acquire the same temperature, and those above them, which are warmer, not being capable of parting with any portion of their heat to them, the first will quietly remain in their places, in consequence of their greater specific gravity; and, of course, very little of the ice will be melted at its upper surface. At the sides it will be differently affected: heat will be communicated from the earth to the particles of air in contact with the sides of the pit, and, being thereby rendered specifically lighter, they will, of course, begin to move slowly upwards: their places below will be filled by those which have not yet become rarefied; and these, settling down from the sides of the ice, will leave a vacancy towards the top. This will occasion the ascending particles to incline towards that vacancy, and, finally, to pass over; then parting with their acquired heat to the ice, become again condensed,

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and in their turn descend. Thus a regular current will be established up the sides of the pit and down the sides of the ice; and by this transportation of heat a considerable portion of the ice will be melted. But as heat is much easier propagated upwards than in any other direction, it follows that a far greater quantity will be communicated to the under surface of the ice than to the sides, even if the stratum of air between it and the bottom of the pit were to remain dry. But it has been premised, that heat increases the capacity of air for moisture, and that moisture increases its power of transporting heat at least four-fold. The dripping from the ice will soon afford moisture in abundance; the particles of air at the bottom will always receive heat from the earth, and becoming at the same instant saturated with moisture, they will ascend with rapidity from every part of the bottom, communicate their contents to the ice, and descend with the same velocity to obtain a fresh supply; so that the quantity of ice melted at the sides will bear but a small proportion to the loss it will sustain at its under surface.

" From what has been said, it will easily be perceived, that this mode of insulating ice with atmospheric air is much to be preferred to filling the pit entirely with ice as first mentioned; because it cannot be supposed that air, which is only capable of conducting heat by means of the internal motion of its particles, even in the state most favourable for the purpose, can convey it from a warm to a colder body, with the same facility that it would be conveyed were the two bodies in actual contact. But experience has proved, that the conducting power of air may be much lessened by filling it with such non-conducting substances as will embarrass the particles in their passage: this is the use of straw between the ice and the sides of the pit, as now commonly used; but notwithstanding the waste of ice is abundantly greater at the bottom than at the sides, as we have just seen, yet I have not known similar precautions taken to prevent it. Indeed, it is questionable whether the same material, used in the same way, would answer any valuable purpose, because the water that would be continually dripping on it would, I believe, greatly lessen its power of resisting the passage of heat. There are, however, other non-conducting substances, which I think may be arranged in such a manner as greatly to prevent the loss sustained at the bottom of the ice."

Mr. M. then goes on to detail the result of his own knowledge and experience, in the arrangement of a suitable repository for ice. This he performs in an answer to the following query.

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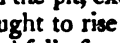
"*What is the most eligible construction for an Ice-house?*

"I will not undertake to say I am fully prepared to answer this question; although I am persuaded that the foregoing statement of the principles on which it depends is correct, and the observations founded thereon are corroborated by experiment as far as I have had an opportunity of attending thereto. Yet I have no doubt but further experience will suggest to intelligent observers, improvements which do not now occur. I will however offer a plan the most simple and cheap that I have yet thought of, consistent with the principles laid down.

"The most favourable situation is a north hill side near the top. On such a site open a pit twelve feet square at top, ten at bottom, and eight or nine feet deep: Logs may be laid round the top at the beginning, and the earth dug out, raised behind them so as to make a part of the depth of the pit. A drain should be made at one corner, the spout to carry off the water should descend from the pit, except a short piece at the outward extremity, which ought to rise thus  ; the depressed part will always stand full of water, and prevent communication with the external air. Dig holes in the bottom of the pit, and set therein four perpendicular corner posts, and an intermediate one on each side; let the insides of these posts form a square of eight feet in the middle of the pit. Then, in order to avoid dampness from below, cover the bottom three or four inches deep with dry sand, if it can be conveniently got. The next thing to be done I consider as the most material, and also expensive part of the business; which is fixing a proper floor for the ice to rest on. In order to do this, let three or four sleepers, supported at the ends, be placed across the square included by the posts; their upper edges about a foot from the bottom, but so that the plank laid thereon may have a descent of a few inches towards one of the sides next the drain. The plank should be two inches thick and about half seasoned; jointed, grooved and tongued, or lathed and grooves cut near the joints, in the upper side, so as to prevent any water from going through. The floor must extend a little without the inner sides of the posts, so that the water dripping from the sides may fall on the floor. Then fix a plank, or spout, at the lower end of the floor in such a manner as to convey the water into the drain. The floor being completed, begin at the bottom, and plank up on the insides of the posts with $\frac{1}{4}$ or $\frac{5}{4}$ plank, lapping the lower edge of each a little on the one below, so that the water may be kept on the inside: this done to the top of the posts (which should be even with the top of the pit), and the inside will be

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completed; except that it will be proper to cover the floor with loose plank previous to putting in the ice. The roof may be composed of any materials, and in any form that will defend the contents of the pit from wet, from the direct rays of the sun, and also admit a free circulation of air: I do not think any could answer the purpose better than one made of thatch, supported by posts a few feet from the ground.

"The mode of filling the house remains now to be considered; and on this much depends.

"Early in the winter fill the interstice between the ice chamber and the bank with clean dry straw closely pressed; this being done early, will prevent the earth from freezing, which would be injurious to the sides of the pit. The ice should be collected in the coldest weather; let it be exposed at least one night to the cold atmosphere after it is removed from the water, which will reduce its temperature many degrees, if the weather is severe. When put into the house, it should be beat small, and I think it would be useful frequently to sprinkle it with a watering pot whilst putting in; the mass would by that means be rendered more compact. When the chamber is filled, cover the whole with a good thickness of straw; but I should suppose it would be best to cover the ice first with plank, supported by the sides of the chamber, only leaving a door to descend through.

"Such a house as has been described will contain about ten ton, and I am persuaded will be found sufficient to afford an ample supply for almost any private family.

"This is nearly the kind I had in view when I estimated the expense would not exceed twenty dollars; and if we calculate on a great part of the business being done by the family, which in the country in general it very well may, the actual out-lay, in many places, need not be five dollars. Those who are less sparing of expence, if they choose, may wall, or what is better, plank up the sides of the pit, and finish the roof in a style of elegance.

"In level situations, where a drain cannot be conveniently dug out from the bottom of the pit; I should suppose it would answer very well to enclose the ice by a mound raised entirely above the surface of the earth, through which the water may be discharged; in other respects to be similar to the foregoing description. This perhaps would not be quite so cool a repository as if under the surface of the earth, unless the mound was very thick; but I am persuaded that the loss of a few degrees in temperature bears very little proportion to the advantage resulting from dryness.

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"If it were certain the floor would be perfectly tight, the passage of heat to the ice would be rendered still more difficult by confining a quantity of dry ashes, saw-dust, straw, or some other non-conductor between the floor and the bottom of the pit."

The reader is now acquainted with the method proposed for making a *magazine of cold*. The next object of the author is to transport ice to any amount that may be required, within a portable chest, to market, in contact with the butter, meat, or any thing intended to be presented there in a refrigerated state, and thereby sold for an advance of price. The author's experience and advice on this head are contained in the following extract:

"I knew that if a tight vessel, composed of some good conducting substance, was surrounded on all sides with ice, that the heat of its contents, whatever they were, would pass rapidly through its sides to the ice, until either the ice was all melted or the vessel and its contents were reduced to the same temperature; but then, while this process was going on, the ice, if exposed in warm weather, would also receive large quantities of heat from the atmosphere; so that to preserve a vessel and its charge of contents in this situation, would require such a quantity of ice as to render it both troublesome and expensive; it therefore appeared necessary to contrive such a covering for the ice as would defend it as much as possible from any heat, except what was received from the thing intended to be cooled. In order to do this, and at the same time to have a vessel of a convenient shape, I had a cedar vessel made in the form of an oval tub, nearly as wide at bottom as top; in this was fitted as large a straight-sided tin vessel as it would contain, open at the top: This of course left interstices between the sides of the tin vessel and the wood, and also at the ends; these interstices were covered by an edging of tin, which was soldered to the upper edge of the tin vessel, and extended on to the upper edge of the wooden vessel, to which it was nailed (but this edging, which connected the two vessels at top, would have been better of wood.) Through this last was cut a hole about an inch and a half square on each side, for the purpose of putting in ice. Over the whole was fitted a wooden lid, fastened by a hinge on one side. A coat or case was then made for it, which consisted of coarse cloth lined with rabbit skins, the fur-side next the cloth and the pelt next to the wood. The coat was in two parts, for the convenience of raising the lid; the part attached to

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the lid had an edging which hung down and covered the joint when shut.

"This being only an experiment, was made on a small scale; the tin vessel being only 14 inches long, six wide and 12 deep: It was used for carrying butter to market, and contained 22lb. Before the butter was put in, small lumps of ice were introduced through the holes into the open spaces left between the sides of the two vessels; the butter, weighed off in pounds, by a peculiar and very expeditious mode of printing, was formed into the shape of bricks, with a device and initial letters in cypher on one side; these being wrapt separately in linen cloths as usual, were put in edgewise: The first tier always became so hard in a few minutes, that the remainder might be built upon it without injuring the shape. When all was in, pieces of cloth were laid over the holes made for putting in the ice, and the lid shut down and fastened. In this condition it was put into a carriage and carried twenty miles to market: but because there was always butter put up in the usual way, and other things to take at the same time, it was carried in the night; had it not have been for this circumstance, there would have been no occasion for going in the night. The butter in the hottest weather was always delivered so hard, that it was difficult to make any impression on it with the finger. Sometimes, after having been exposed in market, and frequently opened, when all was sold out, it has been again filled with other butter so soft as scarcely to admit handling, which, in a little time, has been taken out nearly as hard as the other; and after this, ice has remained in the machine most of the day. When the ice is melted, the water is drawn off at the bottom, or poured out at one of the openings in the top.

"The quantity of ice made use of in these experiments was not fully ascertained; but was proved to be at least twice as much as would have answered the purpose, had the spaces left for it have been only half as large. The whole cost of this machine was about four dollars: The butter always commanded from 4d. to 5d$\frac{1}{2}$ per lb. higher price than any other butter in market; so that four times using it paid the cost.

"In this machine, the heat passes freely from the butter through the tin (which is a good conductor) to the ice, and the ice being surrounded by several good non-conductors, it can receive but little in any other way. The non-conductors are first, the cloth; secondly, the fur on the rabbit skins; thirdly, the thin sheet of air confined between the pelts and the wood; and, fourthly, the wood itself." Yet through all these, a small

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quantity of heat will find its way, which we are to expect will be the case in any arrangement that can be made, but with proper care the quantity will be so small that its effects may be easily overcome.

"The following are some of the useful purposes to which the machine may be applied, besides the one already mentioned. Every housekeeper may have one in his cellar, in which, by the daily use of a few pounds of ice, fresh provisions may be preserved, butter hardened, milk, or any other liquid preserved at any desired temperature: small handsome ones may be constructed for table use, in which liquids, or any kind of provisions, may be rendered agreeable, as far as it is possible for cooling to have that effect. Butchers, or dealers in fresh provisions, may, in one of these machines, preserve their unsold meat without salting, with as much certainty as in cold weather; and I have no doubt, but by the use of them, fresh fish may be brought from any part of the Chesapeake Bay, in the hottest weather, and delivered at Baltimore market in as good condition as in the winter season. But for some of these purposes, and perhaps for all, it will be found eligible to alter the arrangement of materials, and also to make use of some other kinds; particularly for those which are large, and are not intended to be often removed.

"After constructing and using the refrigerator which has been described, as its usefulness depended entirely on a supply of ice, I was naturally led to reflect on the most economical means of preserving it, and hence the foregoing investigation of the subject. In the course of that investigation an improvement in the refrigerator occurred. I clearly discovered, that agreeably to the laws of heat, any refrigerating body, placed in the upper part of a chamber defended from external heat, would certainly receive heat from the atmosphere of the chamber, until a common temperature was produced. I therefore concluded, that if a small tin vessel was attached to the under side of the lid of the refrigerator, to contain the ice only, and the lid made to slide instead of raising up, that the large tin vessel might be spared; which would certainly be a great improvement, especially as in that case there would be no absolute necessity for the wooden vessel to be water tight, and some difficulty attends keeping any other than a hooped vessel in that condition. In order to prove by experiment as far as I had convenience for doing it, I removed the tin vessel from the refrigerator, and placed a vessel containing water, and another milk, on the bottom of the wooden vessel, one at each end; I

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then fixed a pewter bason, containing ice and salt, as near the top as I could to admit the lid to shut over it. I found both water and milk began to freeze in about an hour; and by letting them remain some time longer, they were both frozen to the bottom; the temperature of the room about 55°. Having never before seen or heard of any liquid being frozen by means of ice and salt in a temperature above the freezing point, in any other way than by placing the vessel containing the liquid intended to be frozen in contact with the mixture, this experiment, as far as it went, was encouraging. Some days afterwards, the temperature of the room the same, I fixed the bason containing ice only, as before, and made use of a thermometer to try the effect. I was now disappointed by finding that I could not by this means reduce the atmosphere within the vessel as low as the ice by 6 or 8°. But on a little reflection the cause was very plain. The non-conductors enclosing that portion of atmosphere, were not so perfect but they admitted some heat to pass through, and this continually mixing therewith, before it could be taken up by the ice, would of course always occasion a difference in temperature. This plan will not therefore answer the purpose as well as the other, either when a great degree of coldness is required, or when it is necessary to produce immediate effect. But for those on a large scale, such as would be proper to stand in cellars, or the holds of vessels, I think this last mentioned kind is to be preferred.

"The following I think would be an eligible mode of construction. Suppose it is required to have one whose contents shall be equal to six cubic feet clear of the ice vessel; let a box of wood be made three feet long, two feet wide, and sixteen inches deep in the clear; let another box be made of such dimensions that the first may stand within it, leaving an interstice between, on all sides, and also between their bottoms, of about an inch. The sides and one end of the outside box should also stand an inch or more above the other. Then put as much dry sifted ashes, or rather charcoal dust if it can be had, into the large box as will cover the bottom an inch deep; set the small box within the large one, leaving the space equal on all sides. Then prepare a lid, which may rest on the top of the inside box, after thin strips are nailed on the upper edges thereof, in order to cover the spaces left between the boxes; the edges of the lid confined by a ledge nailed to the outside box, or by a groove, and made to slide endwise: cut a hole of a convenient size near the middle of the lid for the purpose of putting in the ice, and connect a door to it by a hinge. The

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ice vessel must then be fastened to the lid: this should be made of tin or sheet iron, about two feet long, eighteen inches wide, and four inches deep, having a convenient opening at one corner to draw off the water, which may be stopped with a cork: the side and end plates must be five inches wide, one inch of which must have a square turn outwards to admit of its being nailed up to the lid, which will form the top of the vessel. This being done it will be necessary to cut away one end of both boxes, so as to admit the lid with the ice vessel nailed to its under side to draw out. Then fill the space between the boxes at the sides and ends with the same material used between their bottoms; nail on the strips to confine it in, and the wood-work will be finished. The whole may then be covered with coarse blanketing, duffield, or the cloth called lion's-skin, so cut as to admit of the lid being drawn out, and to cover all the joints when shut: at the end cut down, to give room for the ice-vessel, it will be necessary to have a flap of several thicknesses of cloth, attached either to the end of the lid or box in such a manner as effectually to close the opening when the lid is pushed in.

"An easier method of fixing the lid (and perhaps in most cases ought to be adopted) would be, to let the top of both boxes be of equal height, and fasten the lid thereon, having an opening in the middle a little larger than the ice-vessel, through which it may hang down, suspended by the edges of its wooden top, to which it should be nailed as before directed, the joints to be all closed by the woollen covering. The only inconvenience that would attend this mode would be an increased difficulty in opening, on account of its having to be lifted off when full of ice; but this might in some measure be remedied by having suitable handles, and for those that are to be stationary a small pulley.

"Such an ice-vessel as has been described will probably contain about 30lb. of ice in lumps; and is capable of cooling more than 120lb. of any kind of provision or liquids, put in at the average summer temperature, down to 6 or 8° below the coldest spring water. I have not consulted any meteorological tables on the subject; but believe I am safe in stating the mean temperature of this climate, from the middle of the fifth month to the middle of the ninth month (which is about the time ice is useful) rather below 80°. It will then require any article at that temperature, to be cooled 30° to bring it to what was proposed. As it requires 146° or thereabouts of heat to convert ice to water, then, as many thirties as are contained in

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146, so many pounds of the thing intended to be cooled will each pound of ice cool to the degree required, admitting the ice to receive no other accession of heat. For the sake of round numbers, instead of 146 we will say 140, which, divided by 30, quotes $4\frac{2}{3}$; 30 pounds of ice multiplied by $4\frac{2}{3}$ produces 140 pounds of the article to be cooled: if we strike off the fraction $\frac{2}{3}$, which will be just $\frac{1}{7}$ of the ice, on account of that portion of external heat which will find its way in while the articles are cooling, we shall then have 120lb. This is much more than almost any private family would have occasion to put in daily, for the use of the family only. There are, however, some deductions to make for the heat, which would be admitted by frequently opening, and also continually passing through the sides and bottom of the boxes.

"But it is impossible to calculate with certainty on the subject without more accurate experiments than I have yet made. I am however of the opinion, that the average quantity of 20lb. of ice per day will be sufficient in such a refrigerator as has been last described, to answer the purposes of a large family; even admitting that, with other things, the milk of two or three cows should be kept therein: when the weather is very warm, the necessary quantity will probably be greater, and proportionably less when cooler.

"When it is required to produce a great degree of cold suddenly, it will be proper to beat the ice small, and add about $\frac{1}{4}$ its weight of salt; the mixture will melt much sooner than ice alone; and because the freezing point of the brine their union will produce, is 38° below the freezing point of fresh water, and its capacity for heat being greatly increased on its passing to the fluid state, the mixture, while melting, must necessarily be abundantly colder than ice, which constant experience verifies. After the brine has taken up so much heat that it is no colder than ice, it may be drawn off and used for cattle, or any other necessary purpose. I should suppose this practice would be always proper for fishermen when their fish were first put in."

Considering the judicious and practical tendency of this publication, we heartily wish it might be generally read. If it should be extensively perused, we feel a confidence that it would influence many industrious and frugal cultivators to imitate the example, and follow the advice it contains. In the neighbourhood of the city of New-York such improvements would have the happiest effects. We should see butter in a firm and compact form, instead of the soft and half-melted

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state in which it is now sold: vast quantities of meat and fish might be saved which are now thrown away: much stench, corruption and disease would be prevented, and an additional neatness and elegance be given to all this branch of business. When it is recollected that an *ice-house* costs no more than 20 dollars, a *refrigeratory* but *four*, and the ice itself nothing more than the labour of collecting, we earnestly demand what can be the cause of the sloth and supineness of our fellow-citizens on this subject?

ART. II. *A Prospect of exterminating the Small-Pox, Part.* II. *Being a Continuation of a Narrative of Facts, concerning the Progress of the new Inoculation in America; together with practical Observations on the local Appearance, Symptoms, and Mode of treating the Variola Vaccina, or Kine Pock, &c. By* Benjamin Waterhouse, *M. D. Professor of the Theory and Practice of Medicine in the University of Cambridge.* 8vo. pp. 139. *Cambridge.* Hilliard. 1802.

OUR readers will remember that the first part of this publication was reviewed in our vol. iv. p. 176. It is well known to the public that the author was the first person in America who successfully imported and inoculated the vaccine disease. His exertions to introduce, disseminate and vindicate this inestimable substitute for the small-pox, give him a just and elevated distinction among those who have signalized their zeal in the cause of humanity. He seems to have perceived, at his first glance of the discovery, all the important consequences which were likely to result from it, and to have devoted his time and attention to the object with a degree of diligence which eminently deserves the thanks of the community.

We believe no improvement in the practice of physic, of any great importance, was ever adopted by the community with so much readiness as the vaccine inoculation. Yet this too has had no small share of opposition and prejudice to encounter. It is melancholy to reflect how slow and difficult we find the progress of every effort to diminish human misery, especially when it opposes established habits, and is introduced under the character of innovation. If such obstacles impede the course of discoveries which are attended by all the advantages of demonstrative evidence, what can be expected of

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others, which, though equally well founded and important, do not possess the same force of conviction. The benefactors of mankind undergo more labour in obtaining a favourable hearing for their plans of improvement than in all the researches employed in ascertaining and maturing them. It would seem incredible to the inexperienced observer, that the best attested means of averting evil should require so much exertion, patience and perseverance, so much address and management, to persuade the community to receive them even for the purposes of experiment. Yet this is generally the fate of the first endeavours to induce men to accept a deliverance from their most pressing calamities.

We are drawn into these remarks by the recital which the author presents of the embarrassment he underwent in diffusing the new inoculation; partly by the coldness and indifference, partly by the mistakes and inattention, and, in no small degree, by the indirect opposition which took place among those who ought to have been the friends and protectors of the improvement.

It ought likewise, in justice, to be observed, that the details of this pamphlet make honourable mention of many individuals, who, with distinguished alacrity and zeal, stepped forward to support this discovery, and to lend it the whole weight of their influence. By the assistance and encouragement of these the author seems to have been animated to pursue his course with unabated zeal.

Besides the difficulties already noticed, Dr. W. had one to contend with arising from climate; and as this will probably be permanent in our country, and does not seem to be yet sufficiently known, we judge it proper to lay before the reader an account of it in his own words.

"With a fresh supply of matter, then, I recommenced my inoculation in March, 1801, and have continued it with undeviating success to the present time, two short periods excepted. The first interruption in the continuity of my cases happened in the month of July, when the weather was extremely hot, and when I trusted to the infected thread, instead of the fluid warm from the pustule. This accident led to the knowledge of a fact of some importance, and which I suspect is not generally known to those who practise the vaccine inoculation, even in England. It has been sufficiently proved, that in moderate weather, when the mercury ranged between 40 and 70° of Fahrenheit's thermometer, the vaccine virus has retained its activity three months, and even longer. But I found, last sum-

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mer, that perfectly active virus, taken on cotton thread, from cases every way satisfactory (proved so by their recent fluid communicating the disease in perfection), will lose its virtue, when exposed ten or twelve hours, and even less, to 95 or 96° of Fahrenheit's scale. It appears that in such a temperature the virus or vaccine *aura* evaporates. Ever since March, 1801, I have inoculated more or less almost every day, and have scarcely experienced a single disappointment when I took the limpid fluid warm from the pustule; and but few instances of failure when I had recourse to the infected *thread*.* But during the very hot and very dry weather in July, the thread has failed in almost every instance.

"You will see by the abstract from the Meteorological Register, kept in this University by Mr. Webber, Professor of Experimental Philosophy, that the mercury rose almost every day for a fortnight to about 90, sometimes 96, and once to 97 degrees in the shade, and that the hygrometer pointed at 40 and even to 39°.† That this great degree of heat was accompanied with an extraordinary dryness in the atmosphere, which was noticed by our hay-makers, there being scarcely the appearance of dew at sun-rise for nearly a week. Finding these failures in the use of the thread, I was led to investigate the cause, and am now satisfied, that it arose from the dryness which reigned for two or three weeks at this season.

"If a thread, dipped in the oil of lavender, lose its fragrance by an exposure for several hours to the degree of heat just mentioned, can we wonder that the more subtle AURA *vaccina* should in like manner evaporate, and the virus become effete? What tended to confirm me in this opinion was a passage in one of Dr. Jenner's letters, received last year. It is this: 'I shall just say a word in proof of the *extreme delicacy* of the nature of the vaccine fluid, to shew how easily it may be disorganized. In the early part of my practice, I used frequently to evaporate the fluid by the fire upon *threads*, *glass*, or *lancets*, yet with much caution respecting the degree of heat; but experience has taught me, that even this procedure frequently occasioned an unnatural deviation from its perfect state, and a failure in communicating the disease.'

"I hope not to be misunderstood. I can never desire more satisfactory cases of kine-pock (as it is universally denomi-

* "This is to be understood of patients susceptible of the disease; for I find some who appear totally insensible to the action of the virus.

† "The thermometer is Fahrenheit's, the hygrometer De Luc's. See Medical and Physical Journal, No. xxxii. p. 328.

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nated in America), than have occurred at this warm season; but they were produced by the recent fluid, transferred from one patient to another; whereas thread, ever so well imbued with the fluid of these satisfactory cases, and kept for a week, has lost its virtue; being, as I conceive, evaporated and exsiccated by a series of hot and dry days. It is recorded, that when the *Harmattan* blows (which is a very hot and a very dry wind in Africa, when the backs of books crack open, and cabinet furniture flies to pieces) the small-pox could not be communicated by inoculation.* Is it probable the failure arose from this cause?

"As the mercury, if I mistake not, very rarely rises above 84° in Britain, the practitioners there could not have been led to these observations. I believe the mercury seldom rises higher than this in the open ocean in any climate. The vaccine virus, sent me from London and from Bath, has demonstrated that it will *live* nearly four months."

After his account of the progress of the new inoculation in America, Dr. W. proceeds to deliver a number of practical observations on the cow-pock. This part of the work is divided into chapters; the first of which gives some historical sketches of the original discovery by Dr. Jenner, and of the commencement and progress of the disease on this side of the Atlantic. In the second chapter we find a concise and perspicuous account of the lymphatic or absorbent system, which is premised with the view of rendering the contents of the following chapters more easily understood. Chapter third treats of inflammation and its consequent secretion. Chapter fourth bears the title of *inoculation*, and exhibits a minute and correct account of the local and constitutional phenomena of the disease, from the time of the insertion of the virus to the completion of the course. In the fifth chapter the author states many important facts concerning spurious small-pox, a subject which has been far too much neglected, and seems, of consequence, not to be well understood. In chapter sixth, spurious cow-pock is treated of, and an interesting letter from Dr. Jenner on that subject is subjoined. Chapter seventh presents directions as to the mode of performing inoculation; and, in order to discuss this subject satisfactorily, the author describes the structure and functions of the cuticle, rete mucosum, skin, and adipose membrane. The *medical treatment* of the disease is delivered in the eighth chapter. And in the ninth and last

* Philosophical Transactions for 1781.

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chapter Dr. W. inquires, without positively deciding the question, whether this prophylactic of the small-pox has been found in any quadruped in America? An appendix is subjoined, containing some brief biographical account of Dr. Jenner.

This pamphlet contains so large a portion of interesting practical matter, and comes from a gentleman of so much experience on this subject, that we doubt not our readers will be anxious to avail themselves of the perusal of the whole performance.

ART. III. *Strictures on Dr.* Grant's *Essay on Yellow Fever. By* Thomas Dancer, *M. D. London.* Murray & Highley, 12mo. pp. 35. 1802.

A PAMPHLET of between 60 and 70 pages, written at Jamaica, dedicated to the Duke of Clarence, and printed in London, gave rise to the piece now under consideration. The author, whose name is *Grant*, has thereby roused the critical spirit and professional ardour of Dr. Dancer. This acuteness and warmth are not exercised in Dr. G's favour; but in severe remarks upon the style and matter of his publication. It is easily discernible that its faults have not been noticed with the benignant look and gentle voice of friendship. They are treated with an austerity and harshness which bespeak a very different temper.

Of the personal relation and professional competition of these gentlemen, we know nothing; nor is it our desire to mingle in their disputes. To us, at a distance, there is neither temptation nor necessity to take a side either with Dr. G. or his formidable assailant. Our author appears to have examined the subject of his strictures with keen attention: not the attention, however, with which the eagle regards her young, but the attention with which she darts on her prey.

We hope Dr. G. will profit by the free remarks which his adversary has made upon his Essay. If he manages well he will prevent a repetition of them in the next edition. That writer is wise who avails himself of the observations of his foes as well as of his partizans; and, in the present case, it is easy for Dr. G. to disarm Dr. D. of the greater part of his strictures: and, in our opinion, this is the best and most exquisite satisfaction he can take for any injury he may suppose done to his reputation as a physician or a writer. In the mean time, we must acknowledge, that among many solid and valuable ob-

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servations, there are not wanting traits in Dr. D's performance of censoriousness and hypercriticism.

But we would tread lightly on this ground: for as we have not seen the publication which has provoked the strictures, we own ourselves incompetent to pronounce clearly on the controversy. We gather, however, from the piece before us, that the principal subjects of dispute between those two West-Indian authors are very similar to such as exist in the United States among the members of the profession. Dr. Dancer is certain that a diagnostic difference exists between the *Endemic* yellow fever and the *Pestilential* yellow fever (p. 15). He is sure that yellow fever is *contagious* (p. 19). He is strongly opposed to *blood-letting* as a remedy for it (p. 33): and he is a zealous advocate of the treatment of it by *quicksilver* (p. 28). Hence we cannot be at a loss with whom to class him. Doctor Grant, it seems, is the reverse of all this. There can be no doubt then to what sect he belongs: but we shall not enlarge on subjects already often discussed by us; nor express in detailed terms the regret we feel that so valuable a correspondent, and so respectable a writer as Dr. D. should still be a contagionist.

ART. IV. *A certain Bar against the Approach of the Yellow Fever: written for the Good of the Public. By* Joseph Hamilton, &c. Hudson. pp. 22. 16mo. Stoddard. 1800.

POSITIVE language sometimes does great things with the multitude; but it does not always answer so well with reviewers. These audacious skeptics entertain doubts, after all they have seen and read, whether a *certain* preventative of that dreadful distemper is contained in the tiny publication now in their hands. Though it is not improbable that Dr. H. may have persuaded himself that the frequent recurrence of yellow fever since the year 1800, may be the consequence of the neglect with which his advice and prescriptions have been treated.

Dr. Hamilton promises a tract expressly on this disease: this we hope soon to see. In the mean time we gather from the present piece somewhat of his medical creed. He believes that putridity internally not only accompanies the yellow fever, but is the primary cause and bottom of it (p. 3). This exists both in the solids and fluids (ibid): and may be promoted by the peculiar states of the air, and other general causes, in any coun-

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try or place: though it is impossible to determine exactly from premonitory signs, or the nicest examination, when it is likely to break out, or who are to be the first victims (p. 4). These opinions he carries so far, that he not only appears to be a non-contagionist, but he even goes further, and queries, whether an atmosphere contaminated by nastiness and putrefaction can be the efficient cause of the yellow fever? (p. 15).

Thinking thus that the disease almost wholly consists of morbid phenomena, induced by a dissolution "of continuity in the solids and fluids" from *internal* agents, or causes existing *within* the system, Dr. H. lays his principal stress on preventing its attack, by proper regulations of the stomach and bowels. For this purpose he recommends purging at first, and occasionally afterwards with cathartic salt, senna, rhubarb, calomel, or hepatic aloes. After which he directs a tincture of red Peruvian bark ℥i. common snake-root ℥ss. both in fine powder, good white wine lbij. to be taken into the empty stomach once or twice a day, to the amount of three or four spoonfuls at a dose; shaking up the materials well together. This is the medicinal course. As to the dietetic regimen, Dr. H. recommends the taking, in moderation, such drinks, whether vinous, spirituous, &c. as agree best with the constitution. He thinks the *fresh* flesh of land animals ought to be avoided as food (p. 8); and prefers the employment of it when cured with salt (p. 20). If fresh animal food is taken, he gives a preference to fish and aquatic creatures.

We should close our account of this performance here, were it not necessary to offer our protest against Dr. H.'s apology for uncleanness and corruption; for he roundly asserts the innoxiousness of the gases emitted by heaps of putrefying fish, both fresh and salted, scaly and shelled (p. 8). He says the efficient cause of the worst of plagues is not in dirty streets, nor in fens, ponds, nor swamps (p. 15). He declares that rotten and stinking cod-fish never give the men who catch them putrid fevers (p. 16); and that equal immunity attends the cutting up of corrupting whales. These seem to us monstrous and heterodox opinions, contradicted by the general evidence of facts, and deserving our reprehension and discountenance. Medical history, and indeed our own work, furnishes the contradiction and refutation of these assertions of Dr. H. in every particular.

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ART. V. *A Physical Enquiry into the Origin and Causes of the Pestilential Fever. New-York.* Tiebout. 1798. 8vo. pp. 32.

IT may be said without jesting that this is the drollest publication we have ever read upon these afflicting distempers. The author proposes an hypothesis of his own for explaining their origin during the hot season.

But he does not gather his facts or data from books. Without troubling himself with researches into physical geography, practical medicine or experimental chemistry, he comes at once to the point, and states his opinion.

He takes it for granted that the ancient doctrine of the *four* elements is right, as far as it goes; but thinks *two* others ought to be added. One of these is *electrical fire*, and the other is an universal agent, which he calls *mother*.

Our readers will instantly ask what *mother* is? the author informs them that it is the great agent of vegetable and animal life, &c. that it differs essentially from air; that its native region is the surface of the earth; and that it does not descend deep into the earth but by compulsion; sometimes, however, it is forced very far downwards. But although it should nearly reach the centre of gravity, or descend to the bottom of the ocean, it will eventually make its escape and rise to its natural station upon the surface again.

Commonly *mother* rises pure: but it sometimes gets contaminated by combining with other things, especially during the putrefactive process, while the season of augmented heat prevails: then *mother* becomes vitiated and venomous. Thus transformed it rises from beneath, and, in its course upwards, defiles the earth and the water through which it passes. In its way, it creeps into houses, and invades their inhabitants, and makes great havock among the human species. And thus pestilential fevers are accounted for.

Reader, if thou demandest proofs of all this, and requirest us to place before thee conclusive evidence of such an high and serious discovery as a new element of wondrous activity, we must candidly own to thee, that if thou hast read the paragraphs we have written for thee, thou knowest full as much about the matter as ourselves. We have not the pleasure of the author's acquaintance: but when he shall give us a more complete *history of his mother*, we shall be glad to communicate it to thee; though we are apprehensive thou wilt chide us for dwelling too long upon *an old woman's story.*

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ART. VI. *Quincy's Lexicon Physico-Medicum improved: or a Dictionary of the Terms employed in Medicine, and in such Departments of Chemistry, Natural Philosophy, Literature and the Arts, as are connected therewith: containing ample Explanations of the Etymology, Signification and Use of those Terms. From the eleventh London Edition, with many Amendments and Additions, expressive of Discoveries lately made in Europe and America. New-York.* T. & J. Swords. 8vo. pp. 646. 1802.

LEXICONS of the language subservient to common conversation and writing have been long ago compiled with great labour, and are acknowledged, by the critic, the scholar, and the man of plain understanding, to be of great utility. Such compilations are to be found in all the modern tongues which have been at all cultivated; and their number is rapidly increasing. They are catalogues of words, alphabetically arranged, and accompanied with the best information whence they were derived, and what is their signification.

It has been found that as men devote themselves to particular employments, and divide and sub-divide the occupations of life, that new facts are discovered, or new distinctions observed, which require new words to express them. These professional terms, though unnecessary to be understood by the greater part of mankind, are of singular importance to those who are engaged in the particular trade, calling or profession to which they belong. And in the progress of society, lists of the words peculiar to certain branches of business and of common words used therein with peculiar meanings, have repeatedly been made out and published. Thus for example, we have dictionaries of *Agriculture*, in which the rural cultivator may find the terms appropriated to that noble art, regularly arranged and explained. *Navigation* has its dictionary, which the seaman may consult for his better information concerning maritime affairs. *Music* also has its book of definitions. In short, *Chemistry*, *Law*, *Biography*, *Commerce* and *Botany* all have their dictionaries.

The profession of *Medicine*, which, taken in its liberal and whole extent, embraces an immense circle of literature, arts and sciences, has likewise been furnished with a number of similar works. Castelli, Blancard, James, Quincy, Motherby and Hooper are among the number of those who have published medical Lexicons. All these are respectable works, and possess their respective degrees of merit; but none of them seem

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to have been so much in demand as that of the English physician John Quincy. A work published so long ago, which has gone through so many editions, and which almost every medical man among us has consulted a thousand times in the course of his studies, stands not in need of any recommendatory observations from us.

The publishers have given their reasons for re-printing *Quincy's Lexicon*, in a short prefatory dedication to the practical physicians and students of Medicine in America. This we offer to our readers.

"Although there are several Medical Dictionaries extant, yet there was a call for a new edition of the *Lexicon Physico-Medicum* of Dr. Quincy. His work was indeed first published many years ago, and has undergone various editions. And, in the mean time, Motherby's *Medical Dictionary*, and Hooper's work, under a similar title, have been offered to the public in England. It might thence be supposed, by some, that imported copies of these two books would supply the demand within the United States.

"The publishers weighed carefully this consideration. They reflected that the large folio volume of Motherby, though an excellent performance, was too bulky and expensive for the greater part of readers. And on examining the duodecimo production of Hooper, they found, that although it would not be subject to the objection of an high price, yet that it laboured under the disadvantage of being confined to subjects merely professional.

"In short, it was highly desirable that a book of definitions and explanations should be offered to medical gentlemen, which should be cheaper than the former, and more comprehensive than the latter of these dictionaries.

"There was no publication extant which approached so near this character as Quincy's Lexicon. Without costing the purchaser more than a very moderate price, it offers him a great variety of matter. In this edition some obsolete terms have been left out. There was little use in perpetuating words that were never employed by any writer of note or value in modern times. To retain great numbers of hard and uncouth names, which the present state of knowledge did not warrant or require, would be superfluous and disgusting, as well as perplexing to beginners. In these retrenchments, however, the reader may be assured not an article of worth has been omitted.

"In the place of the words left out on account of having

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become antiquated and fallen into disuse, a very considerable number of *new* articles have been added. Some of these are names and definitions not in the original. Others are modern expositions of titles already in the work, but standing in need of correction, to adapt them to the existing state of practice and experiment. And in numberless places of this New-York copy, the pages have been cleared of the typographical and scientific errors which abounded in the London text."

On examining the volume now offered to the public, we find it to contain a great number of corrections, and nearly sixty articles, almost, if not entirely, new. Some of these are very important ones. As specimens of these, we extract the definitions of "Pot-ash" and "Yellow Fever."

"POTASH, potassa, or the common vegetable fixed alkali. It is a saline and concrete substance, not pre-existing in plants, nor formed during their putrefaction, but produced while they are turning to ashes in the fire. It is commonly classed among the simple and elementary bodies, but this is a mistake. Several ingredients enter into its constitution, but it is not certainly known what or which they are.

"A certain degree of heat only is requisite to the perfect formation and goodness of *potash*. If the fire is kept up too long, or too intense, the potash turns to a substance called *pearlash*, which is much weaker and milder. And by urging the heat more fiercely, and for a greater length of time, the alkali turns to what is termed *furnace-ashes*, which, though fair to the eye, possess very little strength and virtue.

"Fire thus can destroy potash, and according to its intensity and duration, can give it various degrees of excellence between the best and the worst sorts. Hence the various qualities of potash, pearlash, &c. known in the markets, and familiar to all artists and manufacturers. Chemists and men of science have latterly indulged miserable mistakes on these points, by affirming, first, that potash was an element; and, secondly, when pure, it was always one and the same invariable production. Now, neither of these assertions is true; for potash is a compound, and six samples of the article may be equally *pure*, and yet be very unlike each other. Independent of adulteration, or mixture with foreign ingredients, such as lime, salt, sand, gypsum, and the like, different parcels of clean and unmixed potash are daily found to vary very materially from one another.

"Potash has a very strong attraction for water. This it attracts from the air in such quantity as to dissolve itself. Such

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spontaneous melting is called *delinquescence*. It combines also very powerfully with acids, forming neutral salts with the sulphuric, septic, muriatic, acetic, tartaric, carbonic, and other oxygenated bases. After these acids have been united to potash, they may be recovered by decomposition of the neutral salt. But they are always found to have undergone some alteration of their properties. There is no more instructive and beautiful example of this than is afforded by the *septic acid*. This offspring of putrefaction has been discovered to be a most active and venomous compound. Like other acids, septic acid can combine with potash. This neutral salt, formed from the acid of putrefaction, and the alkali of burned wood, is saltpetre, the principal ingredient of gunpowder. Septic acid, which is the great agent of human woe in *pestilence*, is quite as mischievous and destructive in *war*. The septic acid, though neutralized by potash, imparts to it qualities so noxious, that it can be safely swallowed only in small doses.

"When saltpetre is decomposed in close vessels, the septic acid is separated in a very new and altered form. Some action going on between it and the potash, materially changes the qualities of both, for the alkali is found, on examination, to be as much and as sensibly modified as the acid. Their union and their separation work great changes in both.

"The septic acid is thus changed in its constitution by the potash. It is further altered by the sulphuric and muriatic acids employed in the decomposition of the saltpetre, and further still by the high heat of the furnace. Exposed to so many causes of new modification and changes, the septic acid, on being disengaged from potash, assumes another name, and other properties. It is less venomous and active than it originally was, and goes by the name of the *nitrous acid*. Even then, it is the most powerful and corrosive of all the acids.

"Through want of attention to this distinction, great mistakes have arisen in chemistry. Some ignorant, and some dull persons have pretended that *nitrous* and *nitric* acids ought to possess all the exact qualities of the native *septic acid*. But they grossly deceive themselves. None of the experiments on the *nitric acid of the shops*, or any of its vapours, &c. have any tendency to lessen the evidence derived from *septic acid and its gas, as engendered in corrupting bodies, and exhaled* from them into the air."

"YELLOW FEVER, a name given to an acute disease, which, during hot weather, particularly in August, September and October, prevails among human beings on the continent of

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North-America and the West-India Islands. It also occurs in the south of Europe, on the coast of Africa, and towards the tropical regions of Asia. In a particular manner it originates and prevails in ships and sea-vessels of all kinds, which are suffered to become nasty with excrements and other corrupting animal matter.

"The term "yellow" is given to the disease, because many who are invaded by it become tinged, or even deeply tinctured with that colour. This change of complexion is no sign of the fatality of the disease, since many persons recover after having become remarkably yellow. In many cases the yellowness increases or comes on after death: But frequently too, it happens, that persons who undergo severe attacks have little or no yellowness. The word, therefore, being employed to express a symptom which many cases of the disease do not possess, is very improper. It is sufficiently clear, that the yellowness is not owing to absorbed or regurgitated bile. It is, therefore, wholly different from the hue which prevails in jaundice.

"It has been called a "fever" too, though many persons have undergone it, without the preceding chill, augmentation of heat, or increased frequency of pulse, which the nosologists consider as necessary forerunners. Persons have often died of what is called yellow fever, without having had either *yellowness*, or the diagnostic signs of *fever*. So imperfect and improper is the name of this distemper.

"The malady has also been distinguished by the appellation of "black vomit," because, in some of the worse forms of it, the sick eject from the stomach a dark-coloured or blackish liquid. This, however, is only a symptom of certain violent cases, but by no means a characteristic of the disease in all instances.

"Some of the French writers have called it the "disease of Siam," from an erroneous notion that it was imported into America from that part of Asia.

"Yellow Fever (for we must call it so, notwithstanding the impropriety of the phrase) seems to have an immediate connection with an atmosphere locally vitiated. The common mischievous agent is septic acid vapour, formed from such animal and vegetable substances as contain its radical azote or septon. This acidifiable basis becoming oxygenated, is highly active and deleterious, exciting a multitude of bad effects upon constitutions predisposed to be acted upon by it.

"The places where this mischievous agent is most readily

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formed, and most highly concentrated, is on board sea-vessels which contain corrupting fish, beef and hides. These articles constitute a large proportion of the cargoes, with which the vessels are loaded which pass between the United States and the West-India Islands. They frequently get into a putrefactive state on board, and then the exhalations, pent up in a tight vessel, become very thick and venomous. Hence it happens, that so many of our seamen are cut off in this trade. They are killed by the poison engendered in their own vessels, and that not unfrequently when they are outward bound, but more commonly while they lie in foreign harbours, or are returning home, because there has been longer time given for the septic matter to turn to poison, and insinuate itself through every space within her. Hence the crew are thrown into yellow fever.

" Next to sea-vessels, cities and towns are most unhealthy; because many of them are built upon low grounds, are inhabited by intemperate and nasty people, and are governed by a wretched police. Beef, fish, hides, and other corrupting things, are usually stored and kept indiscriminately within them, and often vitiate the atmosphere to a noxious degree. In many places, the foundation of the streets, houses, and yards, is a mere collection of putrid mud, corrupting recrements, and animal offal, hardened by commixture with some sand by pressure and by paving. And in addition to these abundant and alarming causes, it is the fashion in the American cities, to collect and retain all the excrements of the inhabitants from year to year, and from century to century. In New-York and Philadelphia this precious material is preserved with great care and expense. The proprietors of lots dig deep pits into the earth, and these they surround with walls of brick and stone, and cover with strong timbers and planks, that nobody may have access to it and steal it away. Here the owners flatter themselves it lies safe and dormant; but they are mistaken. Already has this accumulated excrement poisoned their water; and annually, when the weather is hot enough, does it rise in pestiferous steams, infect the atmosphere, and sicken or destroy those from whose bodies it was discharged, as well as others. Hence, next to ships, cities are the most frequent manufactories of this kind of poison, and undergo most inconvenience from the pestilential distempers which that offspring of nastiness and corruption excites.

" From the like materials which poison ships and cities, may particular tracts of country, individual houses, single rooms in

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a house, or even particular parts of a chamber, become charged with materials that may turn to pestilence, kindle up "yellow fever," and end in "black vomit." Hence we hear of this distemper now and then in the interior parts of the land, far away from ships and sea-port towns.

"Its exciting cause may even be engendered in the human stomach and bowels, from the septic materials of our food. Hence sporadic cases of yellow fever have occurred to individuals who had never visited a ship or a city, and who lived in a healthy neighbourhood, and in a clean house. It is possible for such a person to be thrown into yellow fever from septic acid engendered within his own alimentary canal.

"Yellow fever has been said to be *imported* from foreign places into the United States. And with this opinion many of our citizens console themselves. They are positive that the distemper originates solely in the West-Indies, and is merely derivative to themselves. To these persons it is a sufficient reply, that the West-Indians are quite as positive that it never arose spontaneously in their towns or habitations, but in all cases, without exception, is *imported* to them from New-York, Philadelphia, Baltimore, and our other Atlantic settlements. The truth is, that it does in some degree arise from local and domestic causes in all these places, and, more especially, is locally engendered on ship-board. Nasty, and poisonous ships, the manufactories, the nurseries and vehicles of yellow fever, thus sail from port to port, and give colour to the unhappy and pernicious notion, that the place from whence they last came is sickly; whereas, there is in fact no more connection between the sickliness of a crew, and the state of health in the place whence the vessel sailed, than there is between the corrupting of a cargo of provisions and the latitude of the place at which they were salted.

"Though the exciting cause of yellow fever may be on board a ship from a West-India port, that port or place has nothing to do with it, for it was bred on board the vessel. The way to destroy it, is to cleanse the vessel: and vessels, when nasty, may be rendered clean, by the same means that houses are purified; to wit, by ley, alkaline salts, and lime.

"The exciting cause of yellow fever is, therefore, locally produced *within ships*, and not imported *from foreign countries*. It is, consequently, *not contagious*, as some have mistakenly supposed."

We have examined, with some care, what words standing in the former edition have been left out of this. Some of them

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are rare and useless words, found only in the writings of the early *Greek* physicians, which are but of little moment at present. Others are terms gathered from the *Arabian* authors who formerly wrote on medicine, but whose sentiments are scarcely worth the trouble of finding out. Another class of the expunged terms was derived from the *Alchemists* and the *Schoolmen*. Various *Indian* and *barbarous* names have been omitted; and, lastly, some of the *Generic* denominations of plants, not known to be of any use in medicine or the arts, have been thrown aside as mere stumbling-blocks in the way. No student needs to regret the want of such a collection of obscure and frightful words. On the contrary, they have reason to rejoice, that the publishers, employing their hands like skilful gardeners, have extirpated so many of the weeds. For our own parts, we could wish they had examined a little more narrowly, and pulled up by the roots a number more which we observe to be still occupying the ground, and showing their heads here and there among its choice and valuable productions.

Upon the whole, considering this the best edition of Doctor QUINCY's Lexicon extant, we have no hesitation to recommend it to those who are in want of a Medical Dictionary.

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MEDICAL & PHILOSOPHICAL NEWS.

DOMESTIC.

Correspondence between the Secretary of the Navy and Dr. MITCHILL, *concerning the Dampness which the Gunpowder of the Ships in the American Navy was liable to acquire during a Cruise.*

THE SECRETARY OF THE NAVY TO DR. MITCHILL.

SIR, *Navy Department, January* 11, 1803.

THE cannon powder manufactured in this country acquires, in the course of a cruise, a dampness that renders it unfit for use for a second cruise. This effect it is believed has principally proceeded from the not refining in a proper manner the saltpetre used in the powder.

This communication I make to you, in order that I may have the benefit of your information upon this interesting subject; and that our manufacturers may thus be assisted in ascertaining the ingredient that occasions this dampness, and the best process for extracting it.

With great esteem, I am, Sir,
Your obedient servant,
R. SMITH.

DR. MITCHILL'S ANSWER TO THE SECRETARY OF THE NAVY.

SIR, *Washington, January* 14, 1803.

All the component parts of gun-powder require particular care to render them fit objects of that important manufacture. Different processes have been instituted to prepare, in the proper manner, the charcoal, the brimstone and the saltpetre. The preparation of the carbone is so plain, that the common workman can readily drive off the phlogiston, water and other volatile ingredients from the proper kind of wood, and preserve the coal in a state fit for this or any other use. The preparation of sulphur is equally simple; for by exposing earth or other mineral productions with which it is blended, to the operation of a convenient heat, in close vessels, there takes place, by dry distillation, a separation of the pure material from the foreign substances with which it had been associated.

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The fault you mention in the cannon powder with which the ships of the navy have been furnished, ought not therefore to be ascribed to its carbonic or sulphureous ingredients. For, besides the plainness and simplicity of their preparation, neither of them possesses the power of attracting moisture from the atmosphere in any memorable degree. The former does not unite chemically with water; and the latter shows very little disposition to combine. They may both be considered as averse to form a connection with that fluid.

The evil complained of must then be sought for in the other constituent part of the powder, the SALTPETRE. An examination of the component ingredients of this compound salt will be likely to inform us where the mischief lies.

Saltpetre consists of three distinct materials. 1. Potash: 2. The acid of putrefaction; and, 3. Water. These are combined in certain proportions, and made to cohere by an attractive force. When the constituent parts are pure, and well proportioned, they form fine and unadulterated saltpetre.

But it very often happens that some of the component parts of saltpetre are not pure; or if pure, not compounded in due proportions.

1. The potash, or alkaline basis of saltpetre, is frequently imperfect in its constitution, or vitiated by foreign admixture. Common or sea salt is sometimes combined with it. This, however, is not all. A mixture of lime is often derived from the plaster and other calcareous matter, which abounds in the saltpetre beds and collections. This earth has been found, by experience, to weaken the strength of the powder in two ways. 1. By adding to the weight of that manufactured article, unacidified lime, which is an inactive ingredient, and which has no explosive force; or, 2. By disposing powder to grow damp, whenever acidified lime exists in the form of a septite, and exercises its inherent attractive power of imbibing moisture from the atmosphere and other surrounding objects. In the former case, powder, though dry, will be weak; in the latter, it will imbibe humidity, and also be weak of course. Some years ago, under the French Monarchy, the want of a due explosive force in the powder with which their artillery was served, became a subject of public inquiry. The Academy of Arts and Sciences traced it to an accidental adulteration with lime and calcareous matter, in the Parisian manufactories. To obviate this difficulty, they recommended an addition of as much good Russian or other potash to the saltpetre beds as would saturate completely all the septic acid, and of

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course discharge or precipitate all the lime. By attention to this, the quality of the saltpetre was improved. This may be done when saltpetre abounds either with combined or uncombined lime. Dissolve it in water, and pure potash added so as to saturate it exactly, will detach every atom of lime from its connection. Both the inconveniences above mentioned will be thus prevented.

2. The septic acid may possibly be defective or vitiated in some cases. Of this, however, we know little; and the little we know leads us to be very far from believing the *acid* ingredient of the saltpetre to be much in fault. That sour product of putrefaction is commonly active enough. When floating at large in an aerial form, and poisoning the atmosphere with a pestilential taint, its epidemic ravages are but too well known. It would seem that when held in bondage and enchained by potash, its destructive career was run, and would never be begun again. But it is a curious and admirable fact, that that pernicious acid, which, before its connection with potash, was the chief instrument of pestilence, should, in the act of extrication and enlargement (destructive like dying Sampson), be the principal engine of war. As far as the power of this agent goes, it is mostly strong enough.

3. In a crystallized form, saltpetre, like all other salts, contains a quantity of water. But this water is in a latent state, and not discoverable by an hygrometer. For all the purposes of touch, the substance may be pronounced dry. In a pure and perfectly saturated state of septic acid and potash, there will be no attraction of water from the surrounding air, and consequently such saltpetre will not attract moisture nor cause dampness in the gunpowder into whose constitution it enters.

On the whole, Sir, I believe the fault you find with your cannon powder is to be referred to impurity or adulteration in the saltpetre. There appears good reason to conclude, that the evil will be remedied by a removal or correction of these. I therefore recommend that great care be taken to refine and crystallize the saltpetre. The approved method of doing this may be seen in Rees' edition of Chambers' Dictionary (article Petre), and indeed in most of the books of modern chemistry. By attention to these directions, saltpetre may be obtained in such a state of purity as to make a strong and efficient powder for your cannon, to the annoyance of the enemies of our country.

I have, &c. &c.

S. L. MITCHILL.

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COMPARATIVE ANATOMY.

The Anatomy of Animals has been enlarged considerably by a work in quarto, of 118 pages, published in Bremen, by Dr. I. A. Albers. It appeared in 1802, and seems to be the commencement of a series of numbers, on the dissections of various animals. It is entitled "Beyträge zur Anatomiè und Physiologiè der Thierè met einer kupfertafee." For the information of our readers generally, and especially for such of them as are engaged in studying and teaching anatomy, we make an abstract of the principal subjects upon which it treats: 1. Dissection of the Sea-dog (Phoca vitulina), with a particular description of its skeleton. 2. On the eyes, heart, and Os Hyoides of the Ice-bear (Ursus maritimus). 3. Dissection of Birds. *a* The Buzzard or Falco Buteo. *b* F. apivorus. *c* F. æruginosus. *d* F. nisus. *e* F. Aesaton. *f* Strix Aluco. *g* Psittacus Aracanga. *h* Corvus glandarius. *i* Oriolus Galbula. *j* Anas Moschata. *k* Anas clangula. *l* A. glaucion. *m* A. fuligula. *n* A. clypeata. *o* Colymbus glacialis. *p* Larus ridibundus. *q* Plateala. *r* Charadrius hiaticula. Then follow observations on the construction of the eyes of birds, particularly as respects their cornea, sclerotica, the ciliary ligament, and the iris. And the work is concluded by some physiological *remarks on the respiration* of birds, and an account of a Worm, discovered by Professor Rudolphi, called Strongylus Gigas. The curious in these researches will find much to inform and amuse them in Dr. Albers' work.

REWARDS FOR USEFUL IMPROVEMENTS BY THE IMPERIAL PARLIAMENT OF GREAT-BRITAIN.

We observe by the printed debates in the House of Commons, that Dr. Jenner's petition for a reward in relation to his discoveries in vaccine inoculation, was acted upon on the 3d of June 1802. The motion for rewarding the petitioner with £10,000, was made by Admiral Berkley, and seconded by Sir H. Mildmay. After a conversation, in which Mr. Banks, Mr. Wyndham, Sir James E. Sinclair, Mr. M. A. Taylor, Mr. Hobhouse, Mr. Fuller, the Chancellor of the Exchequer, Mr. Grey, Mr. Wilberforce, and Mr. Courtney, each bore a part, some proposing a larger, and others a smaller sum, Admiral Berkley's motion prevailed by a majority of three votes, there being on a division 59 for, and 56 against it.

On June 24, 1802, Mr. Wilberforce reminded the house of Dr. Carmichael Smyth's petition for a reward, in consideration of his discovery of nitrous fumigation as a preventative of

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infection. The motion was seconded by Mr. Erskine, and supported by Mr. D. Scott, Lord Glenbervie, Mr. Courtney, General Loftus, Sir A. Hammond, and Mr. Addington. The motion was to pray his Majesty to advance the petitioner £5000, and that the house would make good the same. It was carried *nem. con.*

It is curious to observe the proceedings on these petitions, that the reward to Dr. Jenner, for his great and real discovery, could be carried only by a majority of three votes, while that for the pretended and worse than useless discovery of Doctor Smyth should pass unanimously! It would have been more worthily bestowed on Dr. Trotter.

DE WITT'S MAP OF THE STATE OF NEW-YORK.

New-York, at length, possesses an entire and ample map of its territory. The labours of Simeon De Witt, the Surveyor-General, have prepared the materials for publication, and under his eye, Mr. Fairman, the engraver, has executed this work, which has lately been offered to our desiring citizens. There is reason to believe this is, at least, as correct as any map on the American continent. It would perhaps be invidious to say it was more so. In addition to good natural capacity, improved in geometry and astronomy by an excellent education, both theoretical and practical, Mr. D. has possessed, in an uncommon degree, the means of rendering his map exact and complete. For, from the maps formerly extant, he could derive the territorial lines long ago adjusted, on the coast of Long-Island, and between the neighbouring states of Connecticut and New-Jersey. From surveys made since the revolution, and in which he was present and assisted, has Mr. D. acquired a knowledge of the boundaries on the side of Massachusetts, Vermont, and Pennsylvania. The Quebec line, on the 45th degree of latitude, was ascertained by the British government many years ago, and Mr. D. has had great opportunities, in the progress of the surveys of the new lands, to become intimately acquainted with the shores of the river St. Lawrence, and Lakes Ontario and Erie. So much for the outlines or boundaries of a territory extending from the Atlantic ocean to Lake Erie.

Nor has Mr. D. been less fortunate in collecting materials for filling up and finishing this great outline. The State of New-York is divided into territorial districts, called counties, and these counties are subdivided into towns. The county lines being always the exterior or boundary lines of towns, it appeared

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very early on a suggestion of Mr. D. to the Legislature, that, to accomplish the meditated work, a regular survey ought to be procured from every town in the State. The Legislature instantly perceived the force and propriety of this, and directed the Supervisors of all the towns in all the counties from which Mr. D. should require actual surveys of those towns, respectively to furnish them. He was enabled thus to add to the information already in his possession, all the other knowledge from the whole of the State, or any part of it, that he should deem useful for completing the map. During the Legislative session in 1798, Dr. Mitchill was one of the Committee for the House of Assembly, to devise means for obtaining complete returns from some of the delinquent Supervisors.

Mr. D.'s map thus exhibits an entire view of the state of the counties in the State, and of the towns in the counties.

The very irregular form of New-York rendered it impossible to delineate it on a square in the common manner, without including much extra space. This space has, however, been so occupied by Mr. D. that his map, without being made unsightly by blanks and chasms, is rendered greatly more valuable by the additions he has made, of the contiguous parts of New-Jersey, Connecticut, Massachusetts, Vermont, and New-Hampshire. With these supplementary materials, the parts of the sheets not occupied by New-York are agreeably and instructively filled up.

This valuable addition to American Geography is of a size sufficiently large to admit considerable expression in detail. Its extent from E. to W. is four feet and an half, and from N. to S. five feet and an half. It is done in a style, reputable both to the Surveyor-General, and the commonwealth which employs him.

MITCHELL'S MAP OF NORTH-AMERICA.

An instructive map of North-America was published by Dr. Mitchell, in London, about the year 1776. It was afterwards translated and edited in French, by Le Rouge, at Paris, in 1777. This contains notes and explanations in German as well as French. The map is very large, being about six feet from E. to W. and five from N. to S. It includes the country from beyond Fort-Albany, in Hudson's-Bay, to the region south of St. Augustine, in Florida; and from Newfoundland to the head-waters of the Missouri and the other streams from the west. Apparently this was the most complete map of North-America extant at the time of its publication, and even now

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is well worthy of being consulted, as it bears examination very well. It is to be wished we had a connected biography of the author. He seems to be that Dr. Mitchell who published several well-written essays in the London Philosophical Transactions—who examined the vegetables of Virginia, and forwarded them, with descriptions, to Linnæus—who is quoted respectfully by Robertson, in his History of America, in note 38 and 39 to book iv.—and whose manuscript on yellow fever is frequently cited as an authority by Dr. Rush.

SUPERIOR SALUBRITY OF THE NORTH-AMERICAN CLIMATE.

William Constable, Esq. in a letter, dated Greenwich, 20th June, 1802, has written thus to Dr. Mitchill:—"Having purchased the late numbers of your excellent Repository, to send to my friend Swediaur, at Paris, I was struck with the bill of mortality for Portsmouth, as published in your fifth volume, which gives us not quite one death out of fifty-one persons in that town annually, and shows a degree of salubrity in the air and climate I believe altogether unexampled.

"I have, before me, a statistical account of Montpellier, published last year by Morgue, by which the number of deaths appears to be one in 29½ in one of the most healthy cities in Europe; and as Mr. Morgue has kept his register for twenty years with the greatest attention, there can be no doubt entertained of its correctness; indeed, it bears every appearance of accuracy. If, therefore, Dr. Spalding's return can be relied on, we may boast of a climate far more favourable to human life than any known, though the number dying of consumption, (being twenty, or one-fifth of the whole deaths, one hundred) would seem to argue the contrary. By the by, I am greatly surprised to remark such a number, three-fourths of whom, it would appear, were 35 years of age and upwards; as I had conceived an idea (very probably erroneous) that after thirty there was little danger of dying of pulmonary consumption, if that is meant. I throw out this hint to excite inquiry. I recollect to have read some papers formerly in the Philosophical Transactions of Massachusetts, as also in those of the Philadelphia Society, showing the chances of human life to be greater in the Eastern States than in Europe generally: the facts were taken from some small registers kept in Connecticut and Massachusetts, but the difference was by no means so great as a calculation founded on the Portsmouth bill of mortality would make it.

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PERNICIOUS EFFECT OF SEPTIC ACID COUNTERACTED BY LIME.

In the neighbourhood of the street de la Lingerie, in Paris, was yet, of late, a burying-place, where the dead were buried from twenty-four parishes, and wherein, amongst others, in the year 1779, fifteen or sixteen hundred corpses, almost at once, have been interred in a ditch fifty feet deep: the consequence was, that in the year 1782 the cellars under the adjoining houses were poisoned, insomuch that no candle would burn therein, and the persons who ventured to enter them were threatened with suffocation and other bad symptoms. This was naturally to be expected; but remarkable and new it is, that the moisture on the inner walls contained such a terrible poison as scarcely may be found throughout nature. A mason happened to touch the moisture with his hand; three days after, the hand, with the arm (antibrachium), was very much swollen, with great pain, &c. blisters appeared, and, at last, the whole of the epidermis was taken off.

The poison was not rendered inactive before the ditch was covered about half a foot deep with quick-lime, and the further interring discontinued. It is almost incredible, that, some years before, the neighbours beginning to complain about it, the judicium of a certain much celebrated practical physician, Dumoulins, was, that the air impregnated with the exhalations of dead bodies was the most salutary balsam of life that could be inspirated! The black snow of Anaxagoras is nothing in comparison with this!!

[*Litchtenberg's Mag. der Phys.* 2 B. 2 St. p. 177.

MACHINES FOR SAVING LIFE IN CASES OF SHIPWRECK.

Various have been the inventions for preserving the lives of men, when endangered by the sinking or wrecking of vessels in which they sail. The *Life-boat*, constructed by Mr. Greathead, of *South-Shields*, and the *Life-buoy*, recommended by Lord Henniker, are two of the most approved and modern of these humane improvements. Plates and descriptions of them both, may be seen in the annual report of the Royal Humane Society of London for 1802, drawn up by its founder, the philanthropist W. Hawes, M. D. (See that valuable publication, p. 50—53.) An attempt has been made very lately in America, to effect some means of escape from wrecks at sea or on coasts. The inventor is Mr. A. Dubuc Marentille. The description of his machinery and apparatus was printed at Elizabeth-town, New-Jersey, in 1803, in a pamphlet of 18 pages.

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His project is threefold. 1. To construct an *unsubmersible*, or *uninversible boat*. 2. To adapt a few planks to each other very expeditiously in times of danger, so as to form a floating body called a *Wreck-raft*. 3. To form a swimming box, in which a man can rest without oversetting, named a *Sea-sitting-chair*. Mr. Marentille entertains an opinion, that these can be contrived and disposed so as to be easily carried to sea in ships. He affirms them to be cheap, and well adapted to save mariners and passengers in danger of drowning; and he announces that he will exhibit them in New-York, and give further particulars on their construction and use. In this great mart of commerce, which loses so many of its seamen and citizens annually, by the hazards and accidents of its widely extended navigation, there will be ample opportunity of displaying it to the best advantage.

PROGRESS OF MEDICAL EDUCATION IN AMERICA.

Within the last thirty or forty years, and particularly since the termination of the revolutionary war, it has been quite the fashion for students of medicine to qualify themselves for practice by a tedious and expensive tour to Europe. If we judge aright, this custom is on the decline. The opportunities afforded by our seminaries and establishments at home have superceded the necessity of those voyages and journies to foreign countries. On looking over the list of medical graduates at Edinburgh for the 24th June, 1802, we observe that, of twenty-four candidates who were honoured with the Apollonian laurel, seven were from England, five from Scotland, eight from Ireland, two from Barbadoes, and two from Jamaica. *There was not a single one from the United States.* The schools of Philadelphia, New-York, Cambridge, Baltimore, Lexington (Kentucky), and Dartmouth, are engaged in the business of medical education to an extent that is both pleasing and surprising. About sixteen years ago, the remittances to Great-Britain only, for the support of young Americans who were sent thither to be instructed in physic and surgery, amounted to £12,000 sterling per annum at least; and, at that time, the remittances were principally in specie. This was one cause of the scarcity of the precious metals in America, which, though worthy of attention, was scarcely ever believed to be of such serious magnitude. Nothing can more strongly evince the importance of cherishing seminaries in our own land.

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LONDON BILLS OF MORTALITY, WITH REFLECTIONS.

There has been published, in 1801, a valuable work, by William Heberden, jun. M. D. F. R. S. It is entitled, "Observations on the Increase and Decrease of different Diseases, and particularly of the Plague, in the City of London." For this purpose he has consulted the bills of mortality of that great metropolis. He has constructed from them two tables. The first contains a view of the annual christenings and burials for each *year* of the eighteenth century; together with the proportion, out of every thousand, who have died of bowel-complaints, palsy, measles or child-birth. The second gives a *weekly* bill of mortality for ten years, to wit, from 1762 to 1767, and 1794 to 1799; and contains a register of those who died of apoplexy, palsy, or suddenly, and by consumption, fever, convulsions, asthma and dropsy; with the periods of life at which the individuals died. From these calculations there appears to have been, during the last century, a gradual decrease of mortality upon the whole, connected with greater wholesomeness of the city under modern police regulations. There has been a most surprising decrease of bloody-flux, colic and gripes, which, in the first decade of the century, carried off above *one thousand* yearly; but which, during the last ten years of it, destroyed only an average of *twenty*. This is to be ascribed partly to the former cause, and, in a particular manner, to better food, and to improvements in cookery and diet. It has hence been discovered that the practice of inoculating for small-pox has, upon the whole, increased its fatality. This arises from its greater spread and frequency: for while, by the natural small-pox, there die one in six, and by the inoculated small-pox three hundred and ninety-nine out of four hundred recover, yet so much more prevalent is this formidable distemper, when kept up and propagated by artificial means, that more human beings are cut off by its multiplied force, when inoculated, than by its casual ravages in the natural way. Apoplexies, palsies, and sudden deaths, have rapidly increased. They are about twice the number that they were a century ago. The proportion of women who die in child-bed is surprisingly lessened, to wit, from one in 42, which was the rate half a century ago, to one in 938, which was the proportion in 1799 and 1800, in the British Lying-in Hospital.—The greatest number of deaths occurs in January, February and March; the smallest in June, July and August; exactly the reverse of the received opinion. Among persons of sixty years old and upwards, the greatest

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proportion die in the coldest months, and the fewest in the middle of summer. This is owing to the cold. Palsies and apoplexies, for the same reason, are most prevalent in winter, and so are consumptions. Bowel-complaints are most rife in September and October. The popular opinions, that there is something peculiarly wholesome in a sharp frost, and that wet weather is noxious to the human body, are contradicted by facts. Nor does any peculiar mortality accompany the changes from hot to cold, and *vice versa.*

DR. HEBERDEN ON THE PLAGUE.

This intelligent writer rejects the notion of deriving this distemper from foreign countries. The tales of its being brought from Turkey, Egypt, Ethiopia, and China, &c. he considers as frivolous and idle. The places of its chief residence and prevalence have, in fact, always been the *most nasty parts of unclean, crowded, ill-constructed, and badly-managed cities.* It appears to have grown with the growth of the towns and cities, which were founded on the ruins of the Roman Empire and the feudal system, and to have raged from time to time with greater or less violence, all *over Europe,* until the present improvements in clean dresses, clean houses, and clean cities gradually took place, and gained an establishment toward the end of the seventeeth century. (See Heberden, p. 81, for a catalogue of these events). In proportion to the progress of these beneficial alterations in habiliments, manners, economy and police, has the plague been stifled in its origin and birth-places, and in most of them wholly suppressed. This gives a beautiful and comfortable view of the gradual extinction of that fell destroyer of man. It proves, that *Plague* ever has been the *consequence of nastiness and corruption,* accumulated in the persons, clothing, bedding, habitations and residences of human beings. Wherever pure air, clean water, and alkaline salts have been freely introduced to remove uncleanness, the Plague has uniformly vanished. (For a theory of cleanliness, see our vol. v. p. 191 & seq.) And easy and plentiful supplies of fresh atmosphere, of limpid water, and of neutralizing and detergent alkalies, are the great objects of modern police, in opening and widening streets, in constructing aqueducts and water-works, and in cleaning clothes and houses, &c. By these means, it has been proved by almost all the large cities of Europe, that the plague which they used in former days to breed and nurture, can be subdued and exterminated. While society, manners and customs par-

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took of the barbarism of former ages, the plague *perpetually* existed in large cities. And though we commonly hear but of the *great* plague years, when uncommon mortality carried many thousands to the grave, yet it is recorded in the history of those cities, London particularly, that the plague was active *every* year, and destroyed several hundreds, which being comparatively an inconsiderable number, has been generally thought unworthy of notice. It resembled the yellow fever of New-York, Philadelphia, and other American cities; which, though it prevails in some degree every year, only rages with vast destruction at longer intervals of time. In both cases, after a series of years, the *great* calamities only are recollected, and the intervening *moderate* visitations are passed over as non-entities, or are wholly forgotten. It is to be wished, that Dr. H. would trace the change from the *plague* which formerly prevailed, to the *typhus* that *rages now*. Dr. H. in a perspicuous manner, examines the written accounts of the plague, and shows the near resemblance between it and the jail-fever and other malignant and putrid fevers. This he has done with more freedom and talent than we have observed in any European. Such works are calculated to unfetter the human mind, and emancipate it from the superstition and prejudice of former ages. If, as Dr. H. concludes, the cessation of pestilential distempers is chiefly to be ascribed to an happy alteration in manners, to the putting away filth, and to the love of cleanliness in our air, clothes, persons and habitations, how devoutly ought we to labour for the universal prevalence of these *goods*, and for the extinction of their correlative evils!

COAL TRADE BETWEEN THE UNITED STATES OF AMERICA AND FOREIGN PARTS.

Since the country on the shores of the Atlantic has grown bare of its native wood, and the sites of the ancient forests have been turned to plantations, the price of fuel has considerably advanced. Indeed, in some of the larger cities, where wood is the principal material which the neighbouring region furnishes for kindling fires, the expense of purchasing it is one of the heaviest charges upon house-keeping. The average price of oak wood, in the city of New-York, is eight dollars the cord, and of hickory wood twelve dollars the cord. In Philadelphia and some other places it is not quite so dear.

The dearness of fuel has introduced the use of coal. No coal-mines have been discovered or worked to advantage in any place near an Atlantic landing north of Virginia. The

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vast quantities with which Pennsylvania abounds are in the interior counties. From James' River, in Virginia, there is established a considerable coasting trade in the coal dug up near its banks. This inflammable material is conveyed by water-carriage to the greater number of the Atlantic sea-ports. There it is consumed to considerable extent, and would be burned to a far larger amount, had it not to force its way, and make strong competition with the coal which, in the course of trade, is imported from foreign parts. It frequently is found convenient to take it on board as ballast, and the excessive price of wood in the American cities generally enables the carriers of coal to sell it to advantage. Thus the burning of native coal, and of foreign coal, tends to spare our forests, and to reduce, in some degree, the exorbitant price of wood.

The quantity of coal imported from foreign places between the 1st of October, 1800, and the 31st of September, 1801, was as follows; to wit:

In American bottoms,	363,148 bushels.
In foreign bottoms,	301,911
Amounting to a grand total of	665,059

Of this, the quantity brought from Great-Britain was a very large proportion of the whole. Thus there was imported from England, that year, 349,509 bushels.

From Scotland,	233,553
From Ireland,	64,888
	647,950 bushels

of coal in the course of direct trade. The remaining 17,109 bushels comes chiefly from the same places, by a more circuitous route. At the rate of thirty-six bushels to a chaldron, 36÷665,059=18,473 chaldrons, and upwards, of British coal, at least, may be considered as consumed annually in the United States.

CATALOGUES OF BOOKS, PAMPHLETS, AND OTHER PUBLICATIONS RELATIVE TO AMERICA.

A valuable list of authors, and their works on America and American affairs, was made out by WILLIAM ROBERTSON, D. D. and prefixed to his history of the Western World. This monument of this eminent historian's industry and learning answers the twofold purposes of showing to his readers the sources of his information, and of pointing out to his studious successors, the names of the writers, and the titles of their

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works. Afterwards THOMAS JEFFERSON, Esq. gave to the public, in his Notes on Virginia, an instructive catalogue, in chronological order, of many American state papers, with references to the places where they are to be found. The former of these relate more particularly to the West-Indies, and to Spanish America; the latter have a more direct reference to British America, and to the country which is now *Fredon*, or the United States. Both are remarkable for their accuracy. More recently, a collection of state papers was published by EBENEZER HAZARD, Esq. In this important work, a large number of the grants, patents, charters and other documents are published at full length, and are open for the inspection of the American inquirer. We judge from the catalogue of the Historical Society of Massachusetts, that the library of that noble institution contains many precious materials; and the contents of the volumes which they have collected and printed, show how worthily the Rev. Dr. ELLIOT and his associates have laboured. This worthy band of literati are industriously gathering in and preserving the abundant harvest of the historical field, which goes on to yield a more rich and increasing crop from year to year. The Abbé CLAVIGERO's catalogue of the European and Creole authors, who have written on the doctrines of christianity and morality in New Spain, is a curious part of his elaborate history of Mexico. The student of American transactions will be greatly edified and assisted by another chronological catalogue, printed in London, for J. Debrett, in 1789, 4to. pp. 270, and intitled, BIBLIOTHECA AMERICANA. This long enumeration of authors and publications is said to have been begun by Mr. HUMPHREYS, Secretary to the society for propagating the gospel in foreign parts. The work contains an enumeration of the American publications in that society's library. It includes also the list of books and manuscripts relative to North-America and the West-Indies, contained in Sir HANS SLOANE's and Dr. BIRCH's collections now in the British Museum, and among the other books belonging to that learned body. These are digested from the general catalogue edited in 1782 and 1787, by SAMUEL AYSCOUGH. To these extracts is subjoined an extensive catalogue from other sources. This very copious Index the inquirer into American history may consult with great aid and edification.

CONDITION OF THE POOR IN THE CAPITAL OF NORTH-BRITAIN.

There is no reason to refer the plague, typhus, and puerperal fever of Great-Britain to foreign causes. Enough of

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domestic uncleanness and wretchedness exists among the indigent members of society, to stir up all these, and, indeed, worse calamities. There is an address to the public respecting the situation of the poor of Edinburgh during the season of child-bearing and lying-in, which contains important information. It may be deemed authentic, as it is subscribed by William Fettes, Esq. Lord Provost of the city, June 6, 1801. It states that "those benevolent individuals who have taken the trouble of visiting the habitations, and inquiring minutely into the circumstances of the lower ranks of society there, have found that the working poor who live in the married state, in general, reside in habitations consisting of a single apartment, ill ventilated and miserably furnished. The nature of their dwellings deprives them of the comforts of pure air, cleanliness, and rest of body and mind. During the day, a lying-in woman must be exposed to the foul air, noise and bustle of a number of children confined within a single apartment; and during the night she must be disturbed by all the individuals of the family crowding into the bed which ought to be appropriated to her sole use."—From this account it appears that the lower orders of society literally wallow and welter in their own filthy excretions adhering to their skins, clothing, bedding, and apartments; and these excreted fluids turning to poison by fermentative or other chemical action among their constituent parts, in the temperature of the human body (or 96 deg. of Fahrenheit's thermometer), and under atmospherical influence, excite the fevers and febrile distempers which cause so large a part of the mortality, and of the municipal and medical regulations of the populous towns and cities of Great-Britain. Compare this with the addresses to the inhabitants of Manchester and Leeds (Med. Rep. vol. vi. p. 110), and with observations on the people of Tangiers (ibid. p. 334), and consider whether alkaline detergents are not the best and cheapest preventatives of this home-bred mischief.

SITUATION OF THE BRITISH POOR AT NEWCASTLE UPON TYNE.

A sensible, judicious, and humane address has been published, May 14, 1802, by a committee, of whom the Rev. Dr. PROSSER is chairman, for forming an institution to cure and prevent the disorders incidental to poverty, filth, and nastiness, among the poor of Newcastle upon Tyne, and Gateshead, in England. The committee give an affecting account of the

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crowded, unclean, and stifled chambers of their indigent and wretched fellow subjects. In plain terms, the narrative runs thus:—For want of sufficient food to nourish them, of fair water to wash them, of alkaline solvents to cleanse them, and of the pure atmospheric fluid to ventilate them, these unhappy people sink under misery and calamity of the most afflicting kind. Their stomachs and alimentary canals grow torpid for want of the proper stimulus of food and drink to raise excitement; their lacteals and blood vessels languish through denial of alimentary supplies; their strength is prostrated by defect of nutriment and substantial recruiting; their clothing becomes saturated with their perspiratory and other excrementitious discharges; their bedding requires a full charge of the same offensive and loathsome productions; the skin and whole exterior surface of the body is besmeared and begrimed with the like foul and nasty agents.

Fœcal, urinary, perspiratory and other excrementitious mischiefs thus surround the starving and filthy victims of poverty. The rags and wrappers apply and confine the baneful materials with which they are impregnated most closely to the body of the sufferer. In the temperature of such a body (96 deg. or thereabout) these excreted matters ferment, and oftentimes turn to a kind of pestilential poison. This virus, engendered in such degenerating and corrupting masses of excretions, turns its force upon the body that produced it. Thus the venom of pestilence, superadded to starving and nastiness, prostrates the suffering individual more completely and fatally.

The calamity does not always end here. The heat to which these human excretions are exposed is sufficient, not only to convert them to poison, but to elevate them in vapour. The more volatile parts mount towards the cieling, while the more gross and palpable descend to the floor. The air and walls of the apartment become tainted with noxious effluvia. The patient inhales them at every breath; they gradually diffuse themselves to the most distant part of the chamber. In short, the deleterious gases mingle with the atmosphere, and, according to the quantity, the force, and the concentration of the septic emanation, will be the danger of the attendants, bye-standers and visitors. Frequently this aërial offspring of nastiness is too bad for mortal man to bear, and then it sickens and destroys all before it. AKENSIDE, BAILEY, GARNETT, RUSSEL, GRIEVE, MUNCKLEY, and a host of others have been killed by its direful activity.

The committee are intent upon the means of granting re-

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lief to persons thus afflicted. And we observe, with great satisfaction, that the sum of their laudable exertions amounts to this; *to obtain for them better food and drink; to make their bodies clean; to procure them clean clothes and beds; and to provide them a wholesome and pure atmosphere.* Behold an epitome of what is called TYPHUS-CONTAGION, of British FEVER WARDS, and of their HOUSES of RECOVERY!!

Principiis obsta; serò medicina paratur, &c. is a good monition. Why do not these benevolent associations introduce among the poor the use of lime, ley, and other modes of alkalizing at once, and thereby cut up this wide-spreading and ever-growing UPAS TREE by the roots? (See our vol. v. p. 191 & seq.)

It does appear passing strange, that in the present period of society and observation, this *mere septic effluvium* should be conceived to be *a contagion.*

DEATH AND DISSECTION OF THE MAN WHO COUGHED UP STONES FROM THE LUNGS. (*See Med. Rep.* vol. vi. p. 258.)

Joseph Shildigger continued to linger until the 31st of March, 1803. His principal symptoms were increasing dyspnœa, with an expectoration of mucous and purulent matter, sometimes mingled with blood. The expectoration of the stony concretions also continued as before. About three weeks before his death his pain entirely left him; but his difficulty of respiration and shortness of breath increased so much, that he was obliged, by the intolerable anxiety, to preserve an erect posture night and day. At this time an anasarcous swelling of the feet and ancles became sensible, and before he died had spread throughout all the cellular membrane even up to the neck, every part of the body pitting upon pressure.

On opening the body after death, the lungs were found in a most diseased and infarcted condition. Stony concretions were discovered in almost every part of their substance; they, however, were largest and firmest in the lymphatic glands, situated near the bifurcation of the trachea. They were impacted with earthy matter; but though the terrene deposition of the lungs was so extensive and abundant, it was not every where of equal hardness. Some portions were very much indurated, some were moderately firm, and others again in a soft state. The colours varied from a blackish or gunpowder, through different shades of brown to a yellowish hue. In one part there was an adhesion of the right lobe of the lungs to the pleura costalis, and at this point of connection there was a more con-

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siderable stuffing with the earthy concrete than in any other, the viscus seeming to be almost turned to a petrifaction.

BILL OF MORTALITY FOR NEW-YORK.

To Mr. John Pintard, of this City, we are indebted for the following Statement:

"With some pains we have prepared a general bill of mortality from the 1st of November, 1801, when the reports were first commenced, until the last of December, 1802, a period of fourteen months. Of the disorders with which helpless infancy is afflicted, *fits* appear to be more fatal than even the *small-pox*, the ravages of which, thank Heaven, will shortly be erased from the direful catalogue of human maladies. Among the casualties, *drowning*, in consequence of our insular situation, is very frequent: twenty-seven instances occur within the period of twelve months. Within the same term, nine instances of the awful crime of *suicide* are enumerated! In the table of diseases *consumption* usurps a frightful pre-eminence. The cases of mortality under this head amount to nearly *one-fourth* of the total number of deaths. It is only our province to present this gloomy prospectus of "the evils which flesh is heir to." To the physician belongs the more important duty to contemplate the subject, to endeavour to counteract the baneful effects of our variable climate, and to check, by salutary advice, the pernicious consequences of implicitly following the follies and fashions of *dress*, not even judiciously adapted to the more temperate meridians of London and Paris.

"This aggregate view will evince the utility of these reports. The public mind, accustomed to weekly reports, becomes less agitated and alarmed at the sound of death. Medical men, informed of the endemic diseases of our climate, can more effectually devise an antidote. The progress of increase and population can be estimated by these tables, which, to be rendered more complete, ought to be accompanied by those of births and marriages. The melancholy back-ground of mortality ought to be relieved by the more cheering and enlivening scenes of nuptials and christenings. The folio of *profit and loss*, in the records of human existence, cannot be fairly balanced without these tables, for a faithful report of which no provision is as yet made. We are happy to find that a recent act of the Legislature has enabled the Corporation of this city to render the bills of mortality, henceforward, more perfect than they have for some time past appeared. It is sin-

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cerely to be hoped that the clause relative to this head will be rigidly enforced.

Interments in the Burial Grounds of the City of New-York, from the 1st of November, 1801, to the 31st of December, 1802.

	Adults.	Children.	Undistinguished.	Total.
African Church	7	8		15
African Episcopal	1		1	2
African Free		4		4
African Methodist	18	29		47
African Methodist Episcopal Zion	3	4		7
African Society	1	2		3
African Burial Ground	49	77		126
Associate (Scotch) Church	1	3		4
First Associate (do.) Reformed	8	17		25
Second Associate (do.) Reformed	11	19		30
First Baptist	16	26		42
Cameronians	1	6		7
Christ Church	13	36		49
Dutch Reformed	74	135		209
Friends	16	12		28
German Reformed	4	6		10
Hebrew	5	5		10
Lutheran English	17	24		41
Lutheran German	22	29		51
Methodist	25	64		89
Presbyterian	77	126		203
St. Peter's	65	70		135
St. Paul's	110	149		259
Trinity	111	188		299
United Brethren	8	1		9
Universalist	1	2		3
Pottersfield	111	75	302	488
In different burial grounds			20	20
	775	1117	323	2215

Diseases.

Abscess	3	Bite of mad dog	1
Abscess on brain	1	Breaking out	1
Apoplexy	6	Burn	10
Ascites	1	Cancer	5
Asthma	5	Carbuncle	1

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Casualties	26	Jaundice	13
Childbed	27	Inflammation	8
Child distemper	1	Inflammation in lungs	7
Chin-cough	9	Inflammation in bowels	14
Colic	1	Influenza	1
Colic painters	1	Inward gathering	1
Cold	15	Killed and murdered	4
Cold after measles	1	Lax	77
Complication of diseases	1	Lethargy	1
Convulsions	15	Lingering illness	2
Complaint in stomach	1	Lock-jaw	4
Cramp in stomach	3	Mania	1
Consumption	395	Measles	131
Debility	20	Mortification	2
Decay	27	Nervous affection	1
Decline	37	Old age	51
Derangement	2	Palsy	18
Diarrhœa	5	Phthisis pulmonalis	54
Dropsy	53	Peripneumony	8
Dropsy in breast	1	Pleurisy	24
Dropsy in head	13	Quinsy	1
Drowned	27	Rash	1
Drunkenness and intemperance	11	Rheumatism	1
		Rickets	1
Dysentery	24	Rupture	1
Epilepsy	2	St. Anthony's fire	2
Fever	19	Scrophula	3
Fever, bilious	7	Scurvy	1
Fever, hectic	1	Small-pox	108
Fever, intermitting	6	Sore throat	7
Fever, malignant	3	Sore leg	1
Fever, nervous	15	Spasms	1
Fever, putrid	5	Sprue	19
Fever, scarlet	17	Stoppage	1
Fever, slow	2	Stoppage on lungs	1
Fever, yellow	1	Still-born	7
Fits	139	Swelling	1
Flux	8	Sudden death	39
Found dead	1	Suicide	9
Fracture	1	Syphilis	7
Fistula	1	Teething	30
Gravel	3	Thrush	1
Hives	46	Typhus	2
Hydarthrus	1	Vomica	2

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Vomiting blood	2	Worms	31
Vomiting and purging	10	Worm-fever	5
Ulcers	2	Diseases not mentioned	498
Whooping-cough	15		
Ditto and measles	7	Total	2215

Recapitulation of the Number of Deaths from the 1st of November, 1801, to the 1st of December, 1802.

		Adults.	Children.	Undistinguished.	Total.
1801.	November	54	67	17	138
	December	48	55	44	147
1802.	January	57	84	23	164
	February	64	116	12	192
	March	67	117	45	229
	April	52	71	21	144
	May	51	62	10	123
	June	30	42	23	95
	July	44	72	17	133
	August	54	169	25	248
	September	55	88	12	155
	October	65	65	14	144
	November	49	61	28	138
	December	88	72	5	165
	Total	778	1141	296	2215

PURE WELL WATER.

Longstreet's Project for obtaining pure Well-water in Charleston (S. C.) Communicated by Dr. DAVID RAMSAY *to the Editors of the Charleston Telegraph.*

Through the medium of your paper, I beg leave to inform my fellow citizens of the result of an interesting experiment lately made by Mr. William Longstreet. Our knowledge of the interior of the earth on which we tread has been literally superficial. In digging for domestic purposes, we have seldom penetrated more than ten or twelve feet. To go much deeper was generally reputed worse than labour lost, for it always introduced us to bad water. Mr. Longstreet conceived the idea, that by penetrating 40 or 50 feet he would get below the bad water, and find a plentiful supply of a purer fluid than the surface afforded. To bring this theory to the test of experience, he began to dig in a vacant lot in Archdale-street, about two months ago. For the first eleven feet nothing uncommon presented. The next stratum (18 inches)

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was a black marsh mud and sand. This suddenly changed to a yellow sand and clay, and continued so for twenty inches; then suddenly resumed the black appearance, and gradually changed to mud. Mr. Longstreet next came to a bed of oyster, clam and conch shells, many of which were entire. This stratum extended three feet. A yellow sand, intermixed with powdered shells, presented next, and continued for two feet. Between the 12th and 20th feet from the surface, muddy brackish water filled the well fast, so as finally to overcome the most strenuous exertions to empty it. This chiefly ascended from the bottom, for effectual precautions were adopted to prevent any quantity of water from entering by the sides. In such a crisis, a mind of less energy than Mr. Longstreet's would have abandoned the project. Instead of this, he replaced a considerable portion of the earth in the well, and, laying aside his spade, drove down a hollow tube of three inches diameter, in the cavity of which a machine for boring was introduced. These were made to penetrate through the earth to the depth of fifty-four feet from the surface. The soil between the 20th and 47th feet was a continued dry, stiff black clay. A sample of this is in my possession, and has been exhibited before the Medical Society. It is of such a consistence as to bear the chissel or plane, and is capable of being cut into any shape. Knives are sharpened by drawing them over its surface, when made smooth. Another stratum of shells presented itself for the next two feet. The black clay then became less rigid, and soon terminated in sand, with little resistance to the operator. On descending two or three feet, the water ascended the tube 48 feet, so as to be only six feet from the surface, and with such rapidity as to yield fifteen gallons in a minute. The joy of the projector on this event may be more easily conceived than expressed. This water, after exposure to the air for a few minutes, resembled common well-water in taste and appearance, and was nearly of the same temperature.

It readily lathered with soap, and gave satisfactory evidence of its being softer than the water in my pump, and also that which is contained in the public pump opposite to the National Bank. Dr. Prioleau and myself applied to different portions of it the following chemical tests: oxalic acid, alkohol of galls, prussiate of lime, oil of vitriol, muriate of barytes, spiritus cornu cervi, and paper stained with a vegetable blue. None of these produced any alteration in the water, from whence we inferred that it was free from lime, iron,

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copper, lead, vitriolic acid, or any acid whatever in a separate state.

But on mixing a solution of the nitrate of silver with another portion of the same water, it became white and turbid. This proved the existence of the muriatic acid in combination with some base, which base we had reason to believe was soda; or, in other words, that the water contained a small proportion of common salt. The same test being applied to the rain-water in the cistern of the South-Carolina Bank—to snow-water—to water from Mr. Young's farm, three miles from Charleston—from the spring pump in Trott-street—from the pump opposite to Mr. Strobel's in Meeting-street—and from that which is opposite to the National Bank, they all yielded more or less of the same ingredient. The cistern-water of the South-Carolina bank had the least proportion, and the pump opposite to the National Bank the most. The quantity contained in the intermediate waters was to each other in a relative proportion, as they stand in the above list, to the two extremes. Mr. Longstreet's tube-water contained more than the cistern or snow-water, but less than was detected in either of the pumps before-mentioned.

It is probable that no water near Charleston, in its natural state, is wholly free from common salt. The quantity of it in Mr. Longstreet's tube-water is so inconsiderable as to form no objection against its fitness for domestic purposes. It exists in a greater proportion in the water of the spring pump in Trott-street, which is more generally used than any other in Charleston. Nevertheless, the enterprising projector of the experiment has resolved to penetrate the earth twelve or fifteen feet further, if necessary, with the expectation of procuring water perfectly free from salt.

Mr. Longstreet, impressed with a belief that there is such a similarity of soil in all our low maritime country as to afford the same result to the same experiment, and that the supply of water obtained thereby will be inexhaustible and permanent, intends to extend and vary his researches into the bowels of the earth. If further experiments justify the correctness of his theory, he expects to be able to establish, on any proposed spots, inexhaustible reservoirs of water, each sufficient to furnish all the engines in Charleston, even in the driest seasons, with as much water as they can discharge in case of fire.

2dly. To furnish from any given spot, equal to the area of a circle whose diameter is forty-feet, wholesome water from

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a depth that will secure it from all the impurities on the surface of the earth, and in sufficient quantities for the supply of all the families in Charleston.

3dly. To furnish an ample and constant supply of wholesome water for family use, whenever the same may be wanted.

Mr. Longstreet's experiments have already cost one thousand dollars. These observations are volunteered from a conviction that his talents and enterprise merit not only praise, but something more solid, which is as necessary to the philosopher as to all other classes of men. No certain conclusions can yet be drawn of the permanent advantages that may result to the community from the success of a single experiment; but there is good reason to believe that Mr. Longstreet's labours will be far from useless, if his expectations are eventually realised; and it is presumed that he will be remembered by a grateful and obliged community.

NEW NATIONAL DISTINCTIONS.

Proposal to the American literati, and to all the citizens of the United States, to employ the following names and epithets for the country and nation to which they belong; which, at the distance of 27 years from the declaration, and of 20 years from the acknowledgment of their independence, are to this day destitute of proper geographical and political denominations, whereby they may be aptly distinguished from the other regions and people of the earth:

FREDON, the aggregate noun for the whole territory of the United States.

FREDONIA, a noun of the same import, for *rhetorical* and *poetical* use.

FREDONIAN, a *sonorous* name for "a citizen of the United States."

FREDE, a *short* and *colloquial* name for "a citizen of the United States."

FREDISH, an adjective to denote the relations and concerns of the United States.

Example. "FREDON is probably better supplied with the materials of her own history than Britain, France, or any country of the old world: and the reason is obvious; for the attention of the FREDONIANS was much sooner directed, after their settlement, to the collection and preservation of their facts and records, than that of the Dutch and Irish. Hence it will happen that the events of FREDISH history will be more minutely known and better understood than those of Russian,

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Turkish or Arabic. And thereby the time will be noted carefully, when a native of this land, on being asked who he is, and whence he came, began to answer, in one word, that he was a FREDE, instead of using the tedious circumlocution, that he was "a citizen of the United States of America." And in like manner notice will be taken of the association of FREDONIA with Macedonia and Caledonia, as a word equally potent and melodious in sound."

FOREIGN.

TWO KINDS OF ELECTRICITY.

MR. CUTHBERTSON gives the following account of an experiment by which the two kinds of electricity are distinguished, or the direction of the fluid is ascertained:—Insulate two wires, furnished at each end with a ball, three-fourths of an inch in diameter; connect one with the positive, and the other with the negative, conductor of a machine; the balls should be four inches asunder, and between them, at equal distances from each place, a lighted candle, with the center of its flame nearly on a level with the centers of the balls; if the machine be put into motion, the flame will waver very much, and seem to incline rather more to the negative ball than to the positive one; after about fifty revolutions, the negative ball will grow warm, and the positive ball remain cold; if the revolution be continued to about 202, the negative ball will be too hot for the hand to touch, while the other remains as cold as at the beginning. [*Month. Mag. Dec.* 1802.

PROCESS FOR COPYING MANUSCRIPTS.

Citizen Coquebert has lately communicated to the Philomathic Society of Paris, a very simple process for taking a copy of a recent manuscript. The process is the more interesting, as it requires neither machine nor preparation, and may be employed in any situation. It consists in putting a little sugar into common writing ink, and with this the writing is executed upon common paper, sized as usual: when a copy is required, *unsized* paper is taken, and lightly moistened with a sponge. The wet paper is then applied to the writing, and a flat-iron (such as is used by laundresses) of a moderate heat, being lightly passed over the unsized paper, the copy is immediately produced. [*Ibid.*

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LIGHT AND HEAT NOT THE SAME.

Citizen Pictet gives an account of experiments to prove, that light and heat are *not* the same. Opposite to each other he places two concave metallic mirrors; in the focus of one he places a lighted candle, and in the focus of the other a very sensible air-thermometer: he then places between the foci a piece of very thin and transparent glass; the thermometer indicating the transmission of heat, stopped that instant. The two mirrors were placed at the distance of about twenty-five yards one from the other, in order to determine whether the time of the propagation of the radiant heat, from one focus to the other, could be appreciated. A heated, but not luminous ball, was suspended at one of the foci, before which a screen was placed. At the instant that this obstacle was removed, the fluid in the thermometer, which was before perfectly at rest, began to move, and no sensible interval could be perceived between the suppression and the effects of the transmission of heat. [*Ibid.*

GALVANISM.

M. Aldini, Professor at the Institute of Bologna, and nephew of the celebrated Galvani, has visited this metropolis, and given an accurate account of his experiments and discoveries to the Royal Society, before whom the same was read on the 25th ult. (Dec. 1802.) By the various experiments exhibited by this gentleman, both at London and Oxford, he has established the fact, that Galvanism is animal electricity, not merely passive, but probably performing the most important functions in the animal economy. A series of experiments made by this learned Professor shows the eminent and superior power of Galvanism, beyond that of any other stimulant in nature; and it is hoped that it may be applied for the benefit of mankind in disorders of the head, and in apoplexies. Galvanism has been successfully applied in melancholic insanity. Two persons have been cured by it at Bologna. [*Ibid. Jan.* 1803.

Professor Aldini availed himself of the opportunity afforded by the execution of Forster, on Monday, the 17th of January, 1803, for the murder of his wife and child, to repeat his experiments on the theory of his uncle Galvani. A liberal offer had been made him of the use of that subject, by Mr. Keate, surgeon to the King, who was himself present on this occasion. The result of this experiment promises the greatest advantages to the interests of humanity, especially in cases of apparent death by drowning, and other cases of as-

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phyxia. These gentlemen, we understand, found that the corpse, by means of Galvanism, was made to exhibit very powerful muscular contractions before dissection, and that afterwards these contractions continued for seven hours and an half. On the first application of the process to the face, the jaw of the deceased criminal began to quiver, and the adjoining muscles were horribly contorted, and one eye was actually opened. In the subsequent part of the process, the right hand was raised and clenched, and the legs and thighs were set in motion. It appeared, to the uninformed part of the bye-standers, as if the wretched man was on the eve of being restored to life. These facts, which were hitherto unknown, will serve to illustrate the physiology, and the theory of Galvanism, a science which owes the highest obligations to Professor Aldini, who has already exhibited his experiments at Oxford, at Mr. Wilson's Anatomical Theatre in London, and at St. Thomas's and Guy's Hospitals. We learn with pleasure, that the lecturers and pupils of these two hospitals have presented Professor Aldini with a gold medal, in honourable testimony of their approbation.

M. Circaud has recited, in a letter to Delametherie, the results of some Galvanic experiments, which, if correct, will doubtless lead to many important discoveries in animal physiology. The ancient, and now almost exploded, doctrine of the vitality of the blood, and the independence of the vital on the sentient principle, appears to have acquired a high degree of probability by M. Circaud's experiments; the minute particulars of which we shall pass over, confining ourselves to the general result. This is, that the blood drawn from the veins or arteries of an ox, which has just been knocked down, and agitated for a minute or two till coagulation takes place, is susceptible to Galvanic stimuli; as appears from the contractions that take place in the clot thus formed when made to communicate in the usual manner with the Galvanic pile. The coagulum continued to possess this property for about forty minutes, or till it had cooled down to nearly the atmospheric temperature. During the latter part of this period, the contractions having become very feeble, were increased by the affusion of fresh warm blood, or by immersing the clot in the same. A solution of muriate of ammonia had no effect in exciting or increasing the contractions. Hence it appears, that sensibility to Galvanic stimuli is a property of muscular fibre wholly independent on the nerves; and, therefore, not in the least indicative of sensation. [*Ibid. Feb.* 1803.

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From the late important and striking experiments in Galvanism, it appears, 1. That, taking the cessation of excitability to the Galvanic stimulus as the criterion of life, the heart is not the *ultimum*, but the *primum moriens*; for, while the muscles of the limbs were excited to strong contractions, for even several hours after apparent death, the heart was utterly incapable of being excited to action, either by applying the extremity of the metallic arc to the surface, or to the interior of this organ. 2. That the lungs were equally inexcitable as the heart. 3. Not only were the muscles, but the skin and cellular membrane, excited by the Galvanic stimulus. 4. The contractions of the muscles were excited by the metallic arc, applied to the nerves supplying the muscles; but the nerves themselves were not affected. 5. The raising up of the arm was produced, as if by volition, by the Galvanic stimulus. 6. A milky or coagulated matter was formed by repeated contractions of the muscle in contact with the copper wire. 7. When the parts ceased to give out motion, the motion was renewed with augmented force, by wetting them with a solution of sal-ammoniac.

In attempting to restore suspended animation by means of the galvanic stimulus, it is recommended that oxygen gas should at the same time be applied to the lungs.

Mr. Cuthbertson has constructed an instrument by which the Galvanic fluid may be applied effectually, for any length of time, without manual assistance, and will, without doubt, hereafter, be as commonly used as our present electrical machines.

In comparing electricity with Galvanism, it must be observed that the former acts by its intensity, and the latter by its quantity; that the former is sometimes intense enough to strike a man down, and yet not in quantity sufficient to melt a small wire; but the latter will melt metals, and yet scarcely produce a shock.

Mr. Strenger, of Iver, administers the Galvanic influence, in cases of deafness, by applying a small ball to the external orifice of the ear, while a much larger one is held in the patient's hand; the communication is then formed and interrupted alternately, by means of machinery, once in every second, for about four minutes daily, for two or three weeks. He asserts that he has thus restored the sense of hearing to 45 persons. [*Ibid. March*, 1803.

Some curious Galvanic experiments were made lately by Professor Aldini, in Dr. Pearson's lecture-rooms. They were by far more interesting and satisfactory than any we have

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yet noticed, owing to the pains to procure the fittest subjects for the operations. They were instituted in the presence of Gen. Andreossi, Lord Pelham, Duke of Roxburgh, Lord Castlereagh, Lord Hervey, the Hon. Mr. Upton, Mr. Cholmondely, Mr. Anchorn, Mr. Elliot, and several other gentlemen of rank. The Professor was assisted ably, as on former occasions, by Mr. Carpue, Mr. Cuthberston, and Mr. Hutchins.

Among other important facts, it was decisively shown,

1. That a vital attraction subsists between a nerve and muscle; for the suspended sciatic nerves of a frog, after detaching the spine, being brought near the intercostal muscles of a dog, while the assistant who held the frog did, with his other hand, touch the muscles of the thigh of the dog (thus forming a circle): in this situation, the nerves suspended approached, and came into contact with the muscle, as evidently as a silken thread is attracted by sealing-wax.

2. The heart of a rabbit was excited to action in a little time after the animal was killed, but vitality disappeared much sooner than in the other muscles, so that this organ is the *primum*, and not, as Harvey asserted, the *ultimum moriens*. The lungs, liver and spleen, could not be excited to action, even immediately after the animal was killed.

3. The most important fact of all was that of exciting contractions by making a circle of nerves and muscles of different animals, without any metallic excitor or conductors.

4. The head of an ox, recently decapitated, exhibited astonishing effects: for the tongue being drawn out by a hook fixed into it, on applying the exciters, in spite of the strength of the assistant, the tongue was retracted, so as to detach itself, by tearing itself from the hook: at the same time a loud noise issued from the mouth by the absorption of air, attended by violent contortions of the whole head and eyes.

[*London Paper.*

OXYGENATED MURIATIC ACID GAS.

Cit. Potel has discovered that oxygenated muriatic acid gas may be employed with the greatest advantage in all cases of *asphyxia*. Several rats, which had been found drowned, being placed within the action of some of this gas, were speedily resuscitated: he repeated the experiment on the same rats, and on several cats, with equal success: he even made some experiments on himself, which were crowned with success. The Academy of Dijon has appointed commissioners to ascertain the property of this gas in cases of apparent sudden death. [*Month. Mag. Jan.* 1803.

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NITRIC ETHER.

A new method has been discovered, by M. Brugnatelli, of expeditiously obtaining nitric ether by distillation, without external heat: it is thus procured:—Into a tubulated retort is introduced one ounce of sugar, and two ounces of pure alkohol are poured upon it. To the retort is adapted a capacious receiver, enveloped with a cloth dipped in cold water, and the joinings are secured with a single slip of paper. Upon this matter, three ounces of highly-concentrated and smoking nitric acid are poured through the tube of the retort. An effervescence instantly takes place, the mass becomes heated, the sugar is dissolved, ebullition ensues, and the alkohol is etherised, and passes from the retort to the receiver. Thus, in a little time, all the alkohol, converted into excellent ether, of a light orange-colour, and a very agreeable smell, may be collected in the receiver. After the formation of the ether, a small quantity of nitrous gas is disengaged in the operation, which may be discovered by a red vapour. At this moment the receiver should be changed. The residue of the sugar may be readily converted into oxalic acid, by treating it with a fresh quantity of nitric acid.

The same chemist has succeeded in turning oil, in an almost rancid state, into wax. To two parts of oil pour one of alkohol, and then another part of nitric acid. The alkohol was converted into ether. The oil, after growing cold, and standing undisturbed twelve hours, was found changed into a yellowish white substance, coagulated in a single mass, insipid, without smell, and of the nature of wax. [*Ib. Feb.* 1803.

NEW METAL.

M. Ekeberg, an eminent Swedish chemist and mineralogist, has discovered a metallic substance, which he considers as possessed of peculiar properties, and therefore new. He calls it *tantale.* There are two forms under which it occurs in nature; the one is the native oxyd of tantale, formerly taken for an oxyd of tin, and, therefore, called by the Germans *zinn graupen*, but which is now denominated by M. Ekeberg, tantale. The second is the metallic oxyd, in mixture or combination with the earth *yttria;* hence it is called *yttrotantale.* This species is found in Ytterby, in Finland, in granite, dispersed in small nodules about the size of a nut. The circumstances that distinguish the tantale from other metals are, 1. It is absolutely insoluble in acids. 2. It is attacked and taken up by alkalies in considerable quantities, and without much dif-

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ficulty; and is precipitated from its alkaline solutions by the addition of an acid. 3. The colour of the oxyd is white, and does not alter by exposure to fire. 4. Its sp. gr. after having been made red-hot, is=6.5. 5. It melts with phosphat of soda and borax into a colourless glass. 6. When strongly heated with charcoal powder, it agglutinates, and assumes a metallic aspect. The two ores of this mineral being by no means unfrequent in Sweden, it is to be hoped that M. Ekeberg will repeat and renew his experiments on this substance, that its properties and relations may be more fully known.

[*Ibid.*

VEGETABLE IRRITABILITY.

The sensibility with which certain plants appear to be endowed, is it purely mechanical, or has it any analogy with animal sensibility? This question of vegetable physiology has been the object of a memoir of Cit. Dutrouil, member of the Society of Science, &c. of Bordeaux. The author first defines the signification of animal irritability; he next examines how far the movements that are perceived in certain plants, when placed in contact with a foreign body, are the indices of an irritability of this kind; he discovers the cause of these movements in the organization of the plant, and explains them in a manner purely mechanical. The author pays particular attention to the sensitive plant: he attributes the movement which it makes, when touched with the finger, to the action of the electric fluid, and to the sudden disengagement which is produced when put in equilibrium. He confirms this explication, by observing, that if the plant be touched with a body which is not proper to transmit the electric fluid, this movement will not take place. Light produces the same effect on the plant as the contact of the finger, by reason of the electricity which is demonstrated to be contained in that agent. The author afterwards attacks the consequence that certain naturalists draw from the approximation of certain parts of the plant at the period of fecundation (namely, that they are endowed with a certain sensibility), by assigning to this approximation a cause purely mechanical; he does not admit in plants the faculty of perception, except it be that of feeling; and he grounds his opinion on the little analogy that there is between their organization and that of the beings in which this faculty exists, and which they only owe to it.

[*Ibid. March*, 1803.

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Investigation of the History of Cancer, in a Letter from Dr. Denman (of London) to Dr. Mitchill.

SIR,

I am directed by the committee to send you the papers relating to the society for investigating the nature and cure of cancer. From your known abilities and eminence, the society hopes much useful information respecting that disease may be derived.

I remain, with great respect,
Sir,
Your most humble servant,
THOMAS DENMAN.

Old Burlington-street (London), Jan. 27, 1803.

Dr. MITCHILL, *Member of Congress, New-York.*

Copy of the Minutes of the Committee of Superintendance of the Institution for investigating the Nature and Cure of Cancer, &c. Held January 1, 1803.

Mr. Aisley laid before the committee a specimen of a plant with which the North-American Indians are said to cure cancer.

Resolved, That Mr. Aisley be requested to give the thanks of the committee to Mr. Rapalje, the gentleman who supplied the specimen, and that the plant be referred to the medical committee.

The American consul, Mr. Erving, having been pleased to send a paper, containing a case of supposed cancer, which was cured by a certain application, which paper was extracted from an American Magazine;

Resolved, That the thanks of this committee be given to Mr. Erving for his communication, and that the paper be referred to the medical committee.

Dr. Mitchill, member of Congress for New-York, was immediately and unanimously elected a corresponding member of this institution.

Resolved, That Thomas Bernard, Esq. be requested to desire Mr. Erving to take the trouble of sending a copy of these minutes, and the papers relating to this institution, to Dr. Mitchill, at New-York.

THOMAS DENMAN, *Secretary*,
For the Hon. CROPLEY ASHLEY, *Chairman.*

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At a Meeting of the Medical Committee of the Institution for investigating the Nature and Cure of Cancer, March 19, 1802;

PRESENT,

Dr. BAILLIE in the Chair.

WILLIAM SHARPE, Esq.	Dr. SIMS,
EVERARD HOME, Esq.	J. ABERNETHY, Esq.
JOHN PEARSON, Esq.	Dr. WILLAN.

Resolved, That the queries which have been sent to the members of this committee be now taken into consideration.

The said queries having been read and approved, it was resolved that they be printed, and copies of them sent to each of the corresponding members.

QUERIES.

1. What are the diagnostic signs of a cancer?

2. Does any alteration take place in the structure of a part, preceding that more obvious change which is called cancer? If there does, what is the nature of that alteration?

3. Is cancer always an original and primary disease, or may other diseases degenerate into cancer?

4. Are there any proofs of cancer being an hereditary disease?

5. Are there any proofs of cancer being a contagious disease?

6. Is there any well-marked relation between cancer and other diseases? If there be, what are those diseases to which it bears the nearest resemblance, in its origin, progress and termination?

7. May cancer be regarded at any period, or under any circumstances, merely as a local disease? Or does the existence of cancer in one part afford a presumption that there is a tendency to a similar morbid alteration in other parts of the animal system?

8. Has climate or local situation any influence in rendering the human constitution more or less liable to cancer, under any form, or in any part?

9. Is there any particular temperament of body more liable to be affected with cancer than others? And if there be, what is that temperament?

10. Are brute creatures subject to any disease resembling cancer in the human subject?

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11. Is there any period of life absolutely exempt from the attack of this disease?

12. Are the lymphatic glands ever affected primarily in cancer?

13. Is cancer, under any circumstances, susceptible of a natural cure?

Adjourned.

M. BAILLIE.

THOMAS DENMAN, *Secretary.*

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APPENDIX.

ARTICLE I.

REPORT *to* CONGRESS *on* QUARANTINE REGULATIONS.

In the House of Representatives, Feb. 25, 1803, *Dr. Mitchill offered the Report of the Committee to whom was referred the Resolution of the House of the* 15*th inst.*—"*That Provision ought to be made by Law for the Regulation of Quarantine within the District of Columbia.*" (See the Essay on Lazarettoes in Med. Rep. vol. v. p. 243.)

THE term quarantine has been used, in the commercial world, to denote the detention of a ship or vessel at a convenient place, some distance from port, for the space of forty days, for the purpose of freeing her from contagion and infection, supposed to have been transported in her from foreign places. Latterly it means any shorter number of days. Under the persuasion that their own cities and habitations were exempt from such contagion and infection, and that these destructive agents were always introduced from remote places, less salubrious than their own, mankind have taken great pains to protect themselves from external attacks of the distempers which they believed to be prevalent among their neighbours or strangers. By the presumption that contagion was frequent in many foreign settlements, and was readily transported from country to country by commercial communications, have the nations of the earth been influenced in framing the rules and the means of restraint imposed upon their mutual intercourse. They have often looked upon each other as lazars or lepers, and treated visitors and passengers, at certain seasons, as such.

The importance of the subject, as well to the commerce and revenue of the United States as to the happiness and security of her citizens, has induced your committee to look into it carefully. They have endeavoured to gather facts, and to deduce therefrom correct conclusions. And upon the most complete investigation which they have been able to give the subject, they are decidedly of opinion that the ideas generally entertained concerning quarantines are very erroneous.

It is true that certain diseases which afflict mankind, such as small-pox, for example, may be transferred from one per-

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son to another. But, of late, doubts have been entertained in the minds of some of the best observers, of such as have had great opportunities of knowing and judging, whether the like contagiousness is true of yellow fever, and the fever infesting ships.

Sickness of distant places, and the danger arising from any intercourse with them, is one of the trite themes of remark almost every where. At the same time few people can be brought to acknowledge the noxiousness of the soil and atmosphere of the place of their permanent residence. Therefore the inhabitants of the West-India islands are positive that they import yellow fever from Boston, New-York, Philadelphia and Baltimore; while the inhabitants of those cities, respectively, have been quite as decided in their conviction that the same distemper is brought to them from Cape-François, Kingston, Havanna, and Demerara. Both sides are equally positive, and both about equally wrong. During the 700 or 800 years, since the days of the crusades, these erroneous sentiments have been indulged in Christendom. Great embarrassments have been experienced from them; and at this day they seem to be increasing. It is an object worthy the attention of the National Legislature, to correct within these States this growing evil.

It is apparent to your committee, that most, if not all, the infectious diseases which at times afflict the crews of sea-vessels, arise, *not* from the ports or countries they have visited, but from causes which exist *within the vessel*. Human beings, inhabiting such crowded situations, engender and communicate diseases, which increase in frequency and malignity by sloth and uncleanness.—Now, a ship is a human habitation, and sometimes the crew is very numerous, and usually prone to grow unclean. Frequently this uncleanness accumulates to a disgusting degree, and turns to poison. The poison stirs up pestilence. Arrivals from Europe have given recent and woeful proofs of this.

But a ship is not merely a human dwelling; she is also a magazine or store-house. Within her sides, as in a common receptacle, are collected many sorts of things prone to perish and corrupt. Beef, fish, pork, hides, and other animal substances, frequently taint the hold that contains them with their deleterious vapours. This tendency to putrefy is often increased by the scanty quantity and weak quality of the Liverpool salt with which they are put up. Their provision spoiling during the West-India voyages, and rotting on ship-board

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(which is a well-known case in hot climates), render the berths and quarters of the men unhealthy. The crew sicken from the operation of such mischievous agents, and some of them are soon destroyed. The evil is increased when they are obliged to feed upon such tainted or spoiled meat as a part of a daily ration. Not only animal substances, but onions, coffee, Indian corn, and various other vegetables, which are transported from country to country, contribute, by their occasional decay, to render unhealthy the bottoms in which they are carried. From these causes it is well known that provision carried between our ports and the southern islands degenerate; and frequently the vessels conveying them are found in a very filthy and unclean condition. From the corruption of their cargoes, and the uncleanliness of the crews, ships may be filled with a venemous atmosphere, and the timbers, planks, bedding, &c. be charged or impregnated with the inbred mischief. Many ships belonging to the United States afford instructive examples of fevers caused on board, by the exhalations from putrid provisions, on their outward-bound voyages. A corrupting barrel of beef has done great injury within a vessel sailing from Great-Britain to the United States.

It is a remarkable fact, that ships and vessels, though so prone to become foul and pestilential, are seldom cleansed in so complete a manner as they ought to be. From the time that they are launched to the day of their condemnation, few or none of them are perfectly purified. Year after year this foulness increases, insomuch that old ships and vessels are usually the most nasty and loathsome of human habitations.

Ships being thus, from their structure, tenants and cargoes, peculiarly liable to accumulate poison, and being rarely or never cleared out as they ought to be, carry that infectious matter, engendered within them, to all parts of the world. And by a curious and unhappy mistake, the pestilence produced in one of these floating mansions has been almost always ascribed to the place from which she last came, though that place commonly has not had any kind of agency in the matter.

Hence it will appear to every reflecting mind, that the common mode of quarantine, by detaining a foul ship at anchor, will rather increase than remedy the evil intended to be guarded against. Bills of health are nugatory or deceitful; for if a clean ship sails from a sickly place, a foul bill of health will not really indicate an unfavourable state of health on board, nor prove the crew to be infected with the distemper

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that prevails in the port she left; nor will a clean bill prove that the people in a pestilential vessel are in good health, or that she is in a safe or fitting condition to be admitted to port: consequently bills of health are either useless, or worse than nothing. With the Dutch, who are remarkable for clean ships, and who carry the system of purification on board their vessels to a greater extent than any other nation of Europe, quarantine is a mere form only. Pestilence can neither be bred nor continued on board the vessels of the Hollanders.

Instead of the rigorous rules of quarantine adopted in the United States, your committee are of opinion, the mischiefs intended to be guarded against thereby might be more effectually prevented by less injurious means. It is remarkable how little pains are usually taken to accomplish the complete and healthy purification of ships. None of the regulations which have hitherto been made direct the method of performing it, or insist upon it with sufficient energy. A ship cannot be deemed wholesome and fit for a voyage merely because the hold and windows have been opened after she is unladed, her decks washed and scraped, and the bilge-water pumped out. Nor will the smoking her out with brimstone, tar, or nitrous and muriatic vapours, render her a suitable habitation to preserve the health and lives of men. As well might it be pretended, that infected rooms, beds and clothes could be purified merely by letting in the air, and setting fumigating mixtures into action; when all domestic experience teaches that *soap, ley* and *lime*, are the only sure and efficacious auxiliaries in all cases of difficulty and danger.

It is a lamentable fact, that under the present quarantine regulations, in most places, so little regard is paid to cleaning a foetid and infectious ship. Provided she does not transgress the rules *of the port where she happens to be*, by proceeding beyond her prescribed limits, she may, nevertheless, weigh anchor, and go in her foul condition to *any other port or city*, without the least impediment. By this miserable practice is the poison of plague, pestilence, or yellow fever, produced, continued and multiplied, by natural and necessary process on ship-board, and carried to all the places she visits. And while this dreadful custom prevails, there will not probably be an end of the rumours of imported contagion, and all the consequent terror and stagnation of business at home, and of detention of ships and expense of quarantine abroad. The recent accounts of the severe quarantine of an hundred days and more, imposed upon American vessels in some of the

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principal ports of Spain, must fill every friend of our commerce with regret. It amounts to an almost total prohibition of our trade with those cities, and is viewed by your committee as countenanced by the false alarms and unfounded suggestions prevalent among our own citizens. In order to prevent these commercial restraints in some degree, it is necessary to form our health-laws upon more scientific principles, and to regulate our marine and naval intercourse upon maxims more accordant with the means of preserving domestic neatness and household purity on shore.

Considering the great influence of names over human thought and action, and the high importance of a correct nomenclature for legal and scientific purposes, it were to be wished that the term quarantine should be erased from the statute books of the union, and of each particular State. Instead of ordering a vessel to *perform a quarantine*, she ought to be *simply directed to be made clean*. Such foul and infectious vessels, with sickly crews, should be prevented from coming to our cities, or proceeding on any voyage in that situation. Nor is the matter so difficult of execution as many have imagined. When a vessel arrives from any foreign port, let her come to at some convenient place. If any are sick on board, let them be landed, and all uncleanness be put away. If she has any spoiled and putrefied provisions or merchandize on board, let them be also taken out. Then cause her to be scoured and cleansed in every part with pure water, *soap*, *sand*, *alkaline ley*, *lime*, and other sweetening and purifying substances; after which the admission of a plenty of clean and good air will complete the work. These are the methods we use with success to cleanse our habitations on the land. They are equally applicable to habitations on the water. And it is necessary to scour the latter as frequently and as thoroughly as the former. But as individuals who own and navigate vessels are too careless or forgetful to cause them to be frequently and efficaciously cleansed, there is a necessity for public authority to interfere. This interference should be exerted to purify every foul and pestilential vessel that enters a port, and not keep her idly and injuriously riding at anchor. Quarantines may be thus shortened from forty days to less than *forty* hours. *Indeed, they would be nothing more than a thorough ship-cleaning.*

When the civilized world shall, with one accord, enforce the regular and exact purification of ships, there will be nothing on board to turn to pestilential or any other fever-pro-

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ducing agent. And all the inquiry necessary, when a vessel arrives, will be, whether she is clean or dirty. As the latter is almost always the fact, she should be cleansed by public authority, and never suffered to go to sea, no more than enter a port, in a foul internal condition. There would then be no vessels afloat carrying infection within them from place to place, and the tales about contagion from foreign ports would gradually die away, and cease to agitate society, as they now do, to the great detriment of our trade, and disgrace of commerce, medicine and police.

After taking this comprehensive view of the subject, it would have been pleasing to the committee to have proposed something more in detail for the treatment of vessels arriving at the port of Alexandria conformably to these principles; but the advanced period of the session prevents their offering any thing further for the consideration of the house at this time. They content themselves, therefore, for the present, with calling attention to this important subject, and presenting for adoption, as a temporary expedient, a bill for extending the quarantine laws of Virginia to the territory of Columbia.

ARTICLE II.

ADDRESS *from the* AMERICAN BOARD *of* AGRICULTURE *to the* CITIZENS *of the* UNITED STATES.

OF the vast variety of objects to which the energies of the human mind have been directed in the extensive range of science, there is none which merits so much, and which receives so little encouragement from the exertions of the learned as the subject of agriculture. Whether this is attributable to the natural indolence of man, which shrinks from the efforts necessary to extract the useful and the meritorious from the mass of indigested materials which the world presents; or whether the pride of learning disdains to stoop to the scrutiny of objects equally open and intelligible to the informed and the ignorant, the fact remains the same; and the benefits which would result from the adoption of means to collect and distribute such ideas, essays and experiments, as would have a tendency to improve the agricultural and economical arrangements of the nation, is equally demonstrable.

Institutions, in the nature of societies established in other countries, in which theories and facts relating to this important

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subject are received, considered and divulged, and from many of which great good has arisen, show to us experimentally the advantages we are to expect from the establishment of similar institutions here. Partial associations of this kind have already taken place in some parts of the United States; but the field which they embrace, being relatively circumscribed, and no channel of communication and interchange having been hitherto opened, a small portion of the community only have derived advantage from their labours. A remedy to this inconvenience is desirable—and a remedy is attempted. Some gentlemen who are impressed with the practicability of drawing the scattered light on this subject to a focus, and so directing it as to give it a benignant influence, have laid the foundation for establishing a *National Board of Agriculture.* Its progress and its utility will depend on the ardour with which the objects it points to are pursued. Every attempt of this sort will be abortive, every effort nugatory, which is not supported by the aid and co-operation of intelligent practical agriculturists. The assistance of these in every part of the nation is solicited, as is likewise the aid of such societies as have been already established. Some of the most prominent objects, in the opinion of the board, to which the views of those should be directed who feel disposed to support and encourage the views of the establishment, and on which they feel most solicitous for early information, are the following:

1. Details of the valuable improvements which have taken place in machinery, implements of husbandry, and rural economy in general, within the limits of each State.

2. A list and actual communication of such publications as have taken place on this subject in each State; calendars, pamphlets, speculative and practical essays, &c. from the earliest times.

3. Communications relating to, or embracing subjects of agriculture, domestic and rural economy, and mechanics, so far as they may be applied to any of the above subjects, or to manufactures.

4. Speculative and experimental essays on any subject connected with agriculture and domestic manufactures, or tending to throw light on, or improve any particular branch of either.

5. The history of the progress of agriculture from the first settlement of each State to the present time.

6. The present staple articles of cultivation, mode of culture, and average product, within certain described geographi-

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cal limits, with an account of the different species and varieties of such articles.

7. Lists and descriptions of implements of husbandry now in use in various parts of the United States, or in any particular State.

8. Lists and descriptions of the different trees, shrubs and plants, natural and exotic, now growing in the United States, with accounts of their qualities, properties and uses; the probable benefit which would result from introducing new described subjects of culture; and the method of raising, treating, and improving plantations, orchards and vineyards.

9. Names and descriptions of the various kinds of grapes, natural and cultivated, now used; with the method of raising, curing, preserving and sending them away, in different parts of the United States.

10. State of enclosures and fencing. Method, materials and cost of making and raising them.

11. The best method of treating, and schemes for improving exhausted soils.

12. Analytical accounts of different manures now used, or which may probably be successfully introduced into the United States, or any part thereof, with the causes of their operations and effects upon vegetables.

13. Improvements which have taken place, and schemes for improving live-stock of every description; and accounts of the introduction and the changes any of the domestic animals have undergone.

14. Plans for buildings of all kinds, having any relation to husbandry or manufactures, or any branch of either; with descriptions of the materials to be used in erecting them, and estimates of the expense.

15. The best method of making and improving roads, and estimates of the expenses.

Whatever will throw light on the history of the agriculture and manufactures of this country; whatever will have a tendency to meliorate the soil, increase the productions, and lessen labour, will be acceptable to the Society. The objects within the pale of this institution are so numerous and diversified, that in an invitation like the present, it will be impossible to designate each particular subject on which it is desirous of information; much therefore will be left to the discretion of those who feel a disposition to promote the views and intentions of the board, by imparting the result of their reflection and experience. Towards those who may think proper to

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communicate information, the utmost delicacy and decorum will be observed; for whilst the Society reserves to itself the right of making such selections, and promulgating such communications as seem to be best calculated to promote the general good, it will carefully avoid inflicting a wound on the feelings of any correspondent.

The establishment of an extensive Agricultural Museum is another object which seems to promise advantage to the community. A country such as the United States, comprehending an extent of territory, a diversity of soil, and a variety of productions almost unequalled by any other, is peculiarly adapted for commencing the experiment of collecting into one general repository, specimens of whatever may be converted to the useful purposes of man, under the operations and industry of the husbandman and the manufacturer. Whatever the bounty of nature has bestowed upon our country, or whatever the ingenuity of man has contrived as applicable to the views of this institution, might, by right means, be brought into such a compass, as to exhibit to the eye, in one view, the wonderful variety of subjects from which all our necessary and habitual wants are supplied. At the same time that the curious would be gratified in viewing a collection, so novel and so interesting, the more useful classes of society, the husbandman and manufacturer, would derive the most necessary and useful instruction from the same source. Agriculturists of the north and of the south, of the east and of the west, would have an opportunity of meeting upon central ground, and of judging of the propriety of transplanting such vegetable productions as might flourish and become profitable in the different quarters of the nation: in a great variety of instances, a similarity of soil, and a favourableness of situation, would overcome the difficulties to which a diversity of climate frequently gives rise. Manufacturers of every description would behold a variety of mechanism, many of the principles of which would be applied to purposes to which the idea and imagination of the inventors had never extended. The benefits which would result from depositing models of useful implements in this Museum, would be by no means exclusive to husbandmen and manufacturers: on the contrary, they would be reciprocal between the *inventor* and the *user*; for at the same time that the proposed repository would be accessible to all those who should be desirous of adding to, or improving their necessary implements and utensils, an opportunity would be afforded to the inventor of placing his model in a point of view so conspicuous as would soon bring it to that test

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of experience which would determine its merit and general utility.

Under impressions like these, the board have determined to afford a place of deposit for such specimens, delineations, descriptions and models as may be connected with the general design of the institution. The three following heads will comprehend many of the subjects, to which they invite the attention, and solicit the aid of such ingenious persons as may be disposed to favour their establishment

1. Preserved specimens of such rare trees, shrubs and plants, or parts of them, as are useful, or as may be applied to the purposes of agriculture or domestic manufactures.

2. Specimens of such earths, fossils and minerals, as may be used as manures or preservatives in any way, or as are in any manner applicable to either of the above subjects.

3. Models of implements of every description now in use, or which may be beneficially applied in any of the branches of agriculture or domestic manufactures.

A receptacle for them will be provided so soon as the convenience of the board will admit; in the mean time communications will be received by any member of the committee of correspondence.

Published by order of the American Board of Agriculture.

ISAAC BRIGGS, *Secretary.*

Washington, Feb. 22, 1803.

ARTICLE III.

Biographical Memoirs *of the late Dr.* Darwin.

ERASMUS DARWIN, the seventh child and fourth son of Robert Darwin, Esq. was born at Elston, near Newark, in Nottinghamshire, on the 12th of December, 1731: he received his early education at Chesterfield-school, under the Reverend Mr. Burrows, of whom he always spoke with great respect. He was entered, with two of his elder brothers, at St. John's College, Cambridge; and, being intended for the practice of medicine, took the degree of M. B. in 1755, defending, in his *thesis*, an opinion, that the motion of the heart and arteries is produced by the immediate stimulus of the blood. During his residence at Cambridge, Mr. Darwin was elected to one of Lord Exeter's scholar-ships, worth about

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£16. per annum, which, from the meagreness of his father's income at that time, was esteemed a desirable acquisition. After having prepared himself for his future profession, by an attendance on the Lectures of Dr. Hunter, in London, and by a severe course of study at Edinburgh, he contemplated the metropolis as the proper theatre for his exertions. Deterred, however, by the want of an immediate introduction, and the improbability of obtaining immediate patronage, Dr. Darwin thought it altogether more adviseable to settle in the country: the first place to which he went, in the capacity of a physician, was Nottingham, where he was entirely disappointed in his hopes of practice; he removed, therefore, to Litchfield, with letters of introduction to Lady Gresley and the Rev. Mr. Seward. Here his great capacity and various acquirements were more justly appreciated: he resided at Litchfield during a great number of years, in the enjoyment of a very extensive reputation, and a very profitable practice, the foundation of which is said to have been laid by his success in restoring to health a gentleman of fortune in the neighbourhood, whose recovery was despaired of by a numerous circle of friends and acquaintance.

In the year 1757 Dr. Darwin married Miss Mary Howard, daughter of Charles Howard, Esq. by his wife Elizabeth Foley: she died in 1770. By this lady he had five children, two of whom died in their infancy: the eldest son, Charles, he educated to his own profession, but he died in the 20th year of his age, very soon after he had finished his course of studies at Edinburgh, where he gained considerable reputation, by endeavouring to furnish a criterion for distinguishing *pus* from *mucus*.* The second son, Erasmus, was an attorney, and practised at Derby: about three years since (in 1799) he walked into his garden, at dead of night, threw himself into the Derwent, and was drowned. Dr. Darwin's third son, Robert, is a physician, in very extensive practice, at Shrewsbury, and married the daughter of the late Mr. Wedgewood, of Etruria.

Soon after the decease of his wife, Dr. Darwin commenced his laborious work, the *Zoonomia*, which, however, he did not think proper to publish till about eight years since.

* Dr. Darwin edited this posthumous work of his son Charles, which was published in 1780, under the title of "Experiments, establishing a Criterion between mucilaginous and purulent Matter: and an Account of the retrograde Motions of the absorbent Vessels of Animal Bodies in some Diseases."

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In 1778 he obtained a lease of a picturesque spot of ground, about a mile from Litchfield, where a cold bath was erected by Sir John Floyer, an eminent physician in the beginning of the last century: there is a grotto, surrounded by projecting rocks, from the edges of which trickles a perpetual shower of water. This place became his favourite retreat and amusement: here he formed a botanic-garden, and began his poem on the "Loves of the Plants," the scenery of which, "as adapted to love-scenes, and being thence a proper residence for the modern Goddess of Botany," is taken from these sequestered shades:—

> "And if with thee some hapless maid should stray,
> Disastrous Love companion of her way,
> Oh lead her timid steps to yonder glade,
> Whose arching cliffs depending alders shade;
> There as meek Evening wakes her temperate breeze,
> And moon beams glimmer through the tremoling trees,
> The rills, that gurgle round, shall soothe her ear,
> The weeping rocks shall number tear for tear," &c. &c.
>
> *Canto* 1, *line* 25.

In the year 1780, Dr. Darwin was called to attend Colonel Sacheverel Pole, of Radbourne-hall, distant four miles from Derby, and a few months after the decease of the Colonel he married his relict, Mrs. Pole, with a jointure of 600l. per annum, to which 100l. was added, by establishing the validity of a promissory-note, which had been given to her by her former husband. The marriage of Dr. Darwin occasioned his immediate removal from Litchfield to Radbourne, where he resided till he could be accommodated with a house in Derby: in this last situation he remained till about three months before his death, when he removed to an old mansion, called Breadwall Priory, about three miles distant from Derby, which was a commodious and peaceable retirement for his old age. During the last few years, Dr. Darwin was much subject to inflammation in his breast and lungs: he had a very serious attack of this disease in the course of the last spring, from which, after repeated bleedings by himself and a surgeon, he with great difficulty recovered. On the 10th of April last (1802) he was attacked with a severe shivering fit, followed by a correspondent hot one, and accompanied with symptoms of inflammation in his lungs: his surgeon, Mr. Hadley, took from him, in the course of the day, twenty-five ounces of blood: the fever was removed, and in two or three days he became, to all appearance, quite well, and declared himself perfectly recovered. On Saturday, the 17th, he amused himself in his garden, with

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all his children, who were come home from school, probably, on account of the Easter-holidays: in the evening, as he was walking with Mrs. Darwin and a lady of about his own age, the latter remarked, that he would have sufficient employment for ten years in bringing all his plans about the place to perfection. "You, Madam (he replied) have as good a prospect as any body I know, of your age, of living ten years—I have not."—Mrs. Darwin remarked his good looks, spirits, and strength: he said, "I always appear particularly well immediately before I become ill." He sat with his family in the evening, conversing with his usual cheerfulness, went to bed, rose at six on the following morning, and wrote some letters: he was seized with a cold shivering fit, which increased, and was attended with thirst: he then sat down by the kitchen-fire, and drank a considerable quantity of butter milk, but feeling himself much indisposed, he lay down on a sofa, when becoming more cold and torpid, he was raised up, and placed in an arm-chair, where, without pain, or any emotion, he expired, between eight and nine o'clock, in the 71st year of his age.

The death of Dr. Darwin is variously accounted for: it is supposed to have been caused by the cold fit of an inflammatory fever: Dr. Fox, of Derby, considers the disease which occasioned it to have been *angina pectoris*; but Dr. Garlike, of the same place, thinks this opinion not sufficiently well-founded.

Dr. Darwin has left a widow and six children by his last marriage: besides these, there are two natural daughters (Misses Parker) whom he has established at a school at Ashbourne, and for whose instruction and assistance he composed and published his Treatise on Female Education.

During the whole of his life Dr. Darwin was remarkable for great benevolence of disposition, and it was particularly conspicuous in the care he took even of the lowest animals. He had frequently expressed a strong desire, that the termination of his existence might be without pain, having always looked upon death as the less evil of the two. He was of a middle stature, in person gross and corpulent; his features were coarse, and his countenance heavy; if not wholly void of animation, it certainly was by no means expressive. In his gait and dress he was rather clumsy and slovenly, and frequently walked with his tongue hanging out of his mouth.

In the second vol. of *Zoonomia* (Class iv. 1, 2, 15. Art. *Podagra,)* Dr. Darwin relates, that about five-and-forty years ago he was first seized with a fit of the gout; in consequence of which he totally abstained from all fermented liquors, not

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even tasting small-beer, or a drop of any kind of wine: but he ate plentifully of flesh-meat, and all kinds of vegetables and fruit, using, for his drink at meals, chiefly water alone, or cream and water, with tea and coffee between them as usual. By this abstinence from fermented liquors he kept quite free from the gout for fifteen or sixteen years, and from some other complaints to which he had been subject: he then indulged himself occasionally with a little wine and water, cyder and water, &c. but was speedily admonished into his former temperance, by a paroxysm of the gout. He was in the habit of eating a large quantity of food, and his stomach possessed a strong power of digestion; his advice frequently was, "Eat, eat, eat, as much as you can;" but he took every opportunity to impress a dread of all fermented liquors on the minds of his patients, whose diseases he was too ready to represent as originating in the frequent use of them.

In the "Botanic Garden," (Part II. Canto iv. 357, &c.) Dr. Darwin has taken an opportunity to express his strong antipathy against fermented liquors, by comparing their effects to that of the Promethean fire: "The ancient story of Prometheus, who concealed in his bosom the fire he had stolen, and afterwards had a vulture perpetually gnawing his liver, affords so apt an allegory for the effects of drinking spirituous liquors, that one should be induced to think the art of distillation, as well as some other chemical processes (such as calcining gold), had been known in times of great antiquity, and lost again. The swallowing drams cannot be better represented in hieroglyphic language than by taking fire into one's bosom; and certain it is, that the general effect of drinking fermented or spirituous liquors is an inflamed, schirrous, or paralytic liver, with its various critical or consequential diseases, as leprous eruptions on the face, gout, dropsy, epilepsy, insanity."

The pretensions of Dr. Darwin to high rank as a MEDICAL PHILOSOPHER will, of course, bottom themselves in the merits, numerous and solid as they are, of the great work which he gave to the world in the year 1794. In whichever point of view the ZOONOMIA shall be considered, whether as a mere repository of curious natural and medical facts, or as a scheme and system of pathological and physiological disquisition, is probably matter of trifling import, so far as the reputation of its author is concerned. By either mode of appreciation it is unquestionably a noble effort of human labour or of human wit.

In a work, indeed, so varied, so complicated, so extensive,

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it is an easy task, and requiring no extraordinary powers of perception, to discover many lapses in the design and execution: but when we call to mind the vastness of the whole fabric, the bold originality of the plan upon which it is constructed, the curious nature and beautiful arrangement of the materials which compose it, the elegance of all its ornamental, and the solidity of very many of its useful parts, we cannot hesitate to assign to its contriver the merit of uncommon taste, uncommon perseverance, and uncommon skill.

To justify the panegyric which we have now ventured to pronounce, it may seem reasonable to expect that we should present to our readers an analysis of the system invented by Dr. Darwin, in order "to reduce the facts belonging to ANIMAL LIFE into classes, orders, genera, and species; and, by comparing them with each other, to unravel the theory of diseases." Such, however, is the extent of, and so diversified are the topics embraced by his plan, that barely to enumerate the respective titles of the several sections into which it is broken, would be greatly to exceed the comparatively scanty limits within which, by the nature of our arrangement, we are of necessity confined. To the work itself we must and do appeal for our justification, confident, that although its illustrious author may have sometimes erred from excess of ingenuity,* that however he may have been occasionally blinded by too great a love of system, the ZOONOMIA will ever be considered as a production of transcendent merit.

> The work is done! Nor Folly's active rage,
> Nor Envy's self, shall blot the golden page;
> Time shall admire—his mellowing touch employ,
> And mend the immortal tablet, not destroy.

Next to Medicine, Mechanics, and almost every branch of Natural History, engaged his attention. He not only pursued these studies with great ardor and diligence himself, but also embraced every opportunity of cultivating and encouraging them amongst his numerous connections and acquaintance. Very soon after he settled in Derby, he instituted and established a philosophical society and library, both of which were in a flourishing condition at the time of his decease. The society, of which he was president, consists of members who reside in different parts of Nottinghamshire, Derbyshire, and Leicestershire. He also took pleasure in encouraging works in natural history. [*Lond. Mon. Mag.*

* It is with mingled emotions of pride and pleasure that we observe one of the most important and much-questioned of our great philosopher's theories established by Mr. Home's recent discovery and demonstration of the mobility of the nervous fibre.

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